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DRINKING WATER SURVEILLANCE PROGRAM

ANNUAL REPORT - 1986

PLANT SUMMARIES

MAY, 1987

Ontario
Ministry of the Environment

The Honourable
Jim Bradley
Minister

Rod McLeod
Deputy Minister

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ONTARIO MINISTRY OF THE ENVIRONMENT

SUMMARY

The following twenty two water supply locations were included on the Drinking Water Surveillance Program (DWSP) during 1986:

Alvinston
*Amherstburg
Britannia (Ottawa)
R.L. Clark (Toronto)
Dresden
Easterly (Toronto)
Hamilton
R.C. Harris (Toronto)
Harrow-Colchester
Kingston
Lake Huron Supply (Grand Bend)
Lakeview (South Peel)
*Lambton Area Water Supply (Sarnia)
Lemieux Island (Ottawa)
Lorne Park (Mississauga)
*Mitchells Bay
Niagara Falls
Port Stanley
*Stoney Point
*Wallaceburg
*Walpole Island
*Windsor

Results are given of the analyses of about one hundred and forty (140) different parameters, covering microbiological, organic and inorganic substances of concern, as well as process parameters. Over 36,500 (36,859) individual results were assessed in this report. In addition, some 29,677 results were reported in the Ontario Ministry of the Environment report "Drinking Water Survey, St. Clair-Detroit River Area, Update, August 1986", covering the period May 23, 1985 to April 30, 1986 for those locations identified by *.

The discussion of results focuses on health-related parameters found in treated water:

(a) **Organic Substances**

Analysis was carried out for approximately 110 organic compounds.

Trihalomethanes (THMs) were always present in treated waters at all locations. THMs are acknowledged to be produced during the water treatment process and are comprised mainly of chloroform, chlorodibromomethane, dichlorobromomethane with bromoform occurring occasionally. The highest level of THMs found was 206 ug/L at the Britannia Water Treatment Plant in Ottawa. The ODWO* for THMs is 350 ug/L.

Of the other volatile substances analyzed for, only toluene was found in treated water at 2 ug/L at Walpole Island on one occasion. The California State Department of Health Action level for drinking water for toluene is 100 ug/L.

A wide range of pesticides is included in the DWSP list of parameters; some (23) are analyzed routinely while others (a possible additional total of 42) are analyzed for on a seasonal basis, once or twice per year to correspond with their use and/or loss from agricultural land. Of all the pesticides analyzed for, only atrazine was found in treated water, at Alvinston on one occasion, at 1830 ng/L and at Dresden at 1135 ng/L; the interim guideline concentration for drinking water for atrazine (Health and Welfare, Canada) is 46000 ng/L.

Chlorophenolic compounds were analyzed for at most locations and none was found in treated water.

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* Ontario Drinking Water Objectives. Revised 1983. Ontario Ministry of the Environment.

The results for chloroaromatic compounds showed that these could be found sporadically in water supplies. Table A lists the compounds found, their location and concentration in treated water, and their guideline levels. Information from other DWSP sites*, would indicate that such chlorinated compounds tend to appear more frequently in treated water. Ontario Drinking Water Objectives are not available for these substances. However, the Ministry of the Environment has submitted these compounds for consideration for setting drinking water guidelines to the appropriate expert groups.

The treated water from these water supply locations did not exceed any human health-related guidelines for organic substances applicable to drinking water.

(b) **Other Parameters**

The aesthetic ODWO for organic nitrogen was exceeded in the treated water in many supplies; levels of organic nitrogen above the limit can result in taste and odour problems. Turbidity levels exceeded the ODWO limit at a few supply locations on one or (infrequently) more occasions. Turbidity may interfere with disinfection and with the maintenance of a chlorine residual.

Of the other physical, general chemistry and microbiological parameters and metals analyzed, for which there are health-related ODWO, none exceeded the Objectives in treated water.

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* Drinking Water Survey, St. Clair-Detroit River Area. Update August, 1986. Ontario Ministry of the Environment.

TABLE A

CHLOROAROMATIC COMPOUNDS FOUND, DRINKING WATER SURVEILLANCE PROGRAM - 1986 ANNUAL REPORTS

LOCATIONS	COMPOUNDS			
	Hexachloro-ethane[1]	1,2,4,5-Tetra chlorobenzene[2]	1,2,3,5-Tetra chlorobenzene[3]	2,3,6-Tri chlorotoluene[4]
Alvinston WTP*	10 ng/L	-	-	69 ng/L
Amherstburg WTP	17 ng/L 18 ng/L	-	-	-
Dresden WTP*	17 ng/L	-	-	66 ng/L
R.C. Harris (Toronto) WTP	11 ng/L	-	-	-
Lake Huron Water Supply System (Grand Bend)	-	17 ng/L	-	-
Lemieux WTP (Ottawa)	10 ng/L	10 ng/L	-	-
Port Stanley WTP	-	-	16 ng/L	68 ng/L
Stoney Point WTP	12 ng/L	-	31 ng/L	50 ng/L 26 ng/L
Windsor WTP	-	11 ng/L	-	91 ng/L

* Water Treatment Plant.

1. US Environmental Protection Agency, Ambient Guideline = 19000 ng/L.
2. US Environmental Protection Agency, Ambient Guideline = 38000 ng/L.
3. Less toxic isomer of 1,2,4,5-tetrachlorobenzene.
4. No guideline value available.

DRINKING WATER SURVEILLANCE PROGRAM

The Drinking Water Surveillance Program (DWSP) for Ontario is a computerized drinking water information system. The objectives of this program are to provide:

- immediate, reliable, current information on drinking water quality,
- a flagging mechanism for 'Objective' exceedence,
- a definition of contaminant levels and trends,
- a comprehensive background for remedial action,
- a framework for assessment of new contaminants,
- an indication of treatment efficiency of plant processes.

Program

The DWSP began in April 1986 and is designed to eventually include all municipal water supplies in Ontario. Water supply locations have been prioritized for surveillance, based primarily on such criteria as population density, probability of contamination and geographical location.

Once the data base becomes established, an assessment of monitoring requirements for the future will be made; monitoring will be continued at the initial locations at an appropriate level and further locations will be phased on to the program as resources permit. It is

estimated that after 4 years of operation, the program will be monitoring 90 locations.

A major goal of the program is to collect valid water quality data, in context with plant operation characteristics in the plant at the time of sampling.

Assessments are carried out at all locations prior to sampling in order to acquire full plant process and distribution system details, and to designate (and retrofit if necessary) all sampling systems and locations.

Samples are taken of the raw (ambient water quality) and treated water at the treatment plants, and also in the distribution systems. In order to determine possible effects of distribution on water quality, both standing and flowing water in old and new sections of the distribution system are sampled. Sampling is carried out by Ministry of the Environment (MOE) Regional staff and/or Municipal personnel who have been trained in the applicable procedures. Comprehensive sampling kits and documented sampling procedures are made available to samplers. This ensures that samples are taken and shipped according to standard protocols and that field testing will supply reliable data. All analyses are carried out using approved documented procedures.

Data Reporting Mechanism

Final analytical results are usually received by the DWSP reporting system within 6 weeks of the time of sampling. At this time, printouts of the completed analyses are sent to the MOE District Officer and the appropriate MOE regional office, and are also retained by the DWSP co-ordinator. The DWSP is able to monitor analysis results and assess trends. Should the level of

a contaminant exceed a health-related Ontario Drinking Water Objective, action is required as outlined in the publication, Ontario Drinking Water Objectives.* The DWSP issues an "Action Alert" which notifies appropriate MOE and health authorities, and supplies a history of the occurrence of the contaminant in the water supply system concerned.

Parameters Analyzed

About one hundred and forty (140) different parameters are routinely measured on DWSP covering microbiological, organic and inorganic substances of concern, as well as process parameters.

Parameters included in the program are based on the following criteria:

- probability that the substance has the potential to cause problems (health-related or aesthetic);
- probability of occurrence in ambient water;
- availability of routine analytical and sampling methods for monitoring and control purposes;
- feasibility of control.

The range of parameters includes those having Ontario Drinking Water Objectives (ODWO), World Health Organization Drinking Water Guideline values, or other

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* Ontario Drinking Water Objectives, revised 1983, published by the Ontario Ministry of the Environment.

jurisdiction's drinking water objectives (e.g. State of California) as well as compounds of concern to other agencies such as the International Joint Commission, and U.S. Environmental Protection Agency.

The parameters monitored routinely during 1986 are shown in Table 1; this table also includes available guidelines which are appropriate for drinking water, and the analytical detection limit (the lowest concentration that can be detected by laboratory analysis) for each parameter.

Analyses for additional pesticides may be included on certain sampling dates; such additional pesticides are selected from the list shown in Table 1A. These analyses may be done on a seasonal basis, in response to an identified concern or because of a potential for occurrence in certain locations. Seasonal analyses for specified additional pesticides are normally carried out at times corresponding to maximal agricultural use or run-off periods, i.e. in spring and fall seasons.

Drinking Water Guidelines

The Ministry of the Environment published a revised edition of "Ontario Drinking Water Objectives" in 1983.

The primary purpose of drinking water objectives is the protection of the health of the public consuming the water. Aesthetic considerations may also provide a basis for drinking water objectives, since the water should be pleasant to drink. The control of such aspects of water quality as hardness, corrosiveness, etc. is also important. The limits set are considered to outline the minimum requirements necessary to fulfill the above objectives, and may be either health-related or related to aesthetic and other considerations.

Because this survey covered such a large number of parameters, many of them did not have an ODWO. In order to be able to compare data results to health guidelines, it was necessary to refer to objectives and guidelines developed by other jurisdictions.

The footnotes to Table 1 indicate the sources and derivation of the various guidelines.

TABLE 1: DRINKING WATER SURVEILLANCE PROGRAM, PARAMETERS ANALYSED

PARAMETER CATEGORY	Objective Guideline (1)	Detection Limit	PARAMETER CATEGORY	Objective Guideline (1)	Detection Limit
CHEMISTRY:			Barium	1 mg/L	0.001 mg/L
Conductivity	-	0.01 UMHO/CM	Boron	5 mg/L	0.02 mg/L
			Beryllium	-	0.001 mg/L
Hardness	-	0.5 mg/L	Cyanide	0.2 mg/L	0.001 mg/L
Calcium	-	0.1 mg/L	Cadmium	0.005 mg/L	0.0003 mg/L
Magnesium	-	0.05 mg/L	Cobalt	-	0.001 mg/L
Sodium	-	0.1 mg/L	Chromium	0.05 mg/L	0.001 mg/L
Alkalinity		0.2 mg/L	Copper	1 mg/L	0.001 mg/L
pH	-	-	Mercury	1 µg/L	0.01 µg/L
Fluoride	2.4 mg/L	0.01 mg/L	Molybdenum	-	0.001 mg/L
Chloride	250 mg/L	0.2 mg/L	Nickel	-	0.002 mg/L
Residue total (solids)	-	1 mg/L	Lead	0.05 mg/L	0.003 mg/L
Turbidity	1 FTU	.01 FTU	Selenium	0.01 mg/L	0.001 mg/L
Phosphorus	-	0.002 mg/L	Strontium	-	0.001 mg/L
Phosphates	-	0.0005 mg/L	Vanadium	-	0.001 mg/L
Nitrogen Total Kjeldahl	0.15 mg/L*	0.1 mg/L	Zinc	5 mg/L	0.001 mg/L
Ammonium Total	-	0.05 mg/L			
Colour	5 TCU	0.5 TCU	BACTERIOLOGY (RAW ONLY):		
Nitrates Total	10 mg/L as N	.05 mg/L	Total Coliform MF	-	0
			Total Coliform MF BKGD	-	0
Nitrite	1 mg/L as N	0.0005 mg/L	Fecal Coliform	-	0
			Standard Plate Count MF	-	0
METALS:			(TREATED ONLY):		
Uranium	0.02 mg/L(t)	0.002 mg/L‡	Present/Absent (P/A) Test	Absent	Absent
Iron	0.3 mg/L	0.002 mg/L	Total Coliform MF BKGD	-	0
Manganese	0.05 mg/L	0.001 mg/L	Fecal Coliform	0	0
Aluminum	-	0.003 mg/L	Standard Plate Count MF	<500 orgs/mL	0
Arsenic	0.05 mg/L	0.001 mg/L			

TABLE 1: DRINKING WATER SURVEILLANCE PROGRAM, PARAMETERS ANALYSED (cont'd)

PARAMETER CATEGORY	Objective Guideline (1)	Detection Limit	PARAMETER CATEGORY	Objective Guideline (1)	Detection Limit
VOLATILES:			CHLOROAROMATICS:		
1,1-Dichloroethylene	0.3 µg/L(h)	1.0 µg/l	Hexachloroethane	19000 ng/L(e)	1 ng/L
Dichloromethane	40 µg/L(c)	5 µg/L	1,3,5-Trichlorobenzene	10000 ng/L(y)	5 ng/L
TRS-1,2-Dichloroethylene	-	1 µg/L	1,2,4-Trichlorobenzene	15000 ng/L(y)	5 ng/L
1,1-Dichloroethane	-	1 µg/L	Hexachlorobutadiene	4500 ng/L(e)	1 ng/L
Chloroform	350 µg/L++	1 µg/L	1,2,3-Trichlorobenzene	10000 ng/L(y)	5 ng/L
1,1,1-Trichloroethane	1000 µg/L(c)	1 µg/L	2,4,5-Trichlorotoluene	-	5 ng/L
1,2-Dichloroethane	10 µg/L(h)	1 µg/L	2,3,6-Trichlorotoluene	-	5 ng/L
Carbon Tetrachloride	3 µg/L(h)	1 µg/L	1,2,3,5-Tetrachloro-benzene	-	1 ng/L
Benzene	10 µg/L(h)	1 µg/L	1,2,4,5-Tetrachloro-benzene	38000 ng/L(e)	1 ng/L
1,2-Dichloropropane	-	1 µg/L	2,6,A-Trichlorotoluene	-	5 ng/L
Trichloroethylene	30 µg/L(h)	1 µg/L	1,2,3,4-Tetrachloro-benzene	-	1 ng/L
Dichlorobromomethane	350 µg/L++	1 µg/L	Pentachlorobenzene	74000 ng/L(e)	1 ng/L
Toluene	100 µg/L(c)	1 µg/L	Total PCB's	3000 ng/L(t)	20 ng/L
1,1,2-Trichloroethane	6 µg/L(e)	1 µg/L			
Chlorodibromomethane	350 µg/L++	1 µg/L	PESTICIDES:		
Tetrachloroethylene	10 µg/L(h)	1 µg/L	Hexachlorobenzene	10 ng/L(h)	1 ng/L
Chlorobenzene	100-300 ng/L(h)*	1 ng/L	Heptachlor	3000 ng/L***	1 ng/L
Trifluorochlorotoluene	-	1 µg/L	Aldrin	700 ng/L**	1 ng/L
Ethylbenzene	1400 µg/L(e)	1 µg/L	PP-DDE	d	1 ng/L
Ethylene Dibromide	0.02 µg/L(x)	1 µg/L	Mirex	-	5 ng/L
P-Xylene	620 µg/L(c)	1 µg/L	Alpha BHC	700 ng/L(c)	1 ng/L
M-Xylene	620 µg/L(c)	1 µg/L	Beta BHC	300 ng/L(c)	1 ng/L
O-Xylene	620 µg/L(c)	1 µg/L	Gamma BHC (Lindane)	4000 ng/L	1 ng/L
Total Trihalomethanes	350 µg/L++	3 µg/L	Alpha Chlordane	7000 ng/L***	2 ng/L
Bromoform	350 µg/L++	1 µg/L	Gamma Chlordane	7000 ng/L***	2 ng/L
1,1,2,2-Tetrachloroethane	1.7 µg/L(e)	1 µg/L	Oxychlordane	-	2 ng/L
1,4-Dichlorobenzene	400 µg/L(e)	1 µg/L			
1,3-Dichlorobenzene	400 µg/L(e)	1 µg/L			
1,2-Dichlorobenzene	400 µg/L(e)	1 µg/L			

TABLE 1: DRINKING WATER SURVEILLANCE PROGRAM, PARAMETERS ANALYSED (cont'd)

PARAMETER CATEGORY	Objective Guideline (1)	Detection Limit	PARAMETER CATEGORY	Objective Guideline (1)	Detection Limit
Pesticides (cont'd)					
OP-DDT	30000 ng/L(d)	5 ng/L			
PP-DDD	d	5 ng/L			
PP-DDT	d	5 ng/L			
Methoxychlor	100000 ng/L	5 ng/L			
Heptachlor Epoxide	3000 ng/L+++	1 ng/L			
Endosulfan 1	74000 ng/L(ea)	2 ng/L			
Dieldrin	700 ng/L**	2 ng/L			
Endrin	200 ng/L	4 ng/L			
Endosulfan 2	74000 ng/L(ea)	4 ng/L			
Endosulfan Sulphate	-	4 ng/L			
Octachlorostyrene	-	1 ng/L			
Toxaphene	5000 ng/L	PA(xx)			

Footnotes:

(l) = Ontario Drinking Water Objectives (ODWO) for drinking water, unless noted.

(t) = ODWO Interim maximum acceptable concentration (IMAC) for drinking water.

(c) = California State Department of Health Action Level for drinking water.

(d) = ODWO for DDT (contains other isomers such as OPDDT and PPDDT).

(e) = US EPA ambient guideline; guideline levels when it is assumed that untreated water and fish and shellfish are consumed from the same body of water.

(ea) = United States Environmental Protection Agency (US EPA) ambient level for endosulfan (contains other isomers).

(h) = World Health Organization (WHO) guideline for drinking water.

(h)* = World Health Organization (WHO) Odour Threshold for drinking water.

(x) = State of Florida, maximum contaminant level for drinking water.

(xx) = the presence of toxaphene is detected in scan used; positive samples would be quantified by special additional analysis.

(y) = New York State (Taste and Odour) proposed drinking water guideline.

++ = total Trihalomethanes.

+++ = combined total; Heptachlor and Heptachlor Epoxide.

* = total Kjeldahl Nitrogen minus Ammonia Nitrogen.

** = total of Aldrin and Dieldrin.

*** = Chlordane is a mixture of alpha and gamma isomers.

‡ = Analysis changed to mass spectrometry method in mid-1986, detection limit 0.0001 mg/L.

TABLE 1A: DRINKING WATER SURVEILLANCE PROGRAM SPECIAL PESTICIDES

Dicamba
2,4-D
2,4-DB
2,4-DP
2,4,5-T
Silvex (2,4,5-TP)
Picloram
2,4,6-Trichlorophenol
2,4,5-Trichlorophenol
2,3,4-Trichlorophenol
2,3,5,6-Tetrachlorophenol
2,3,4,5-Tetrachlorophenol
Pentachlorophenol
Diazinon
Dichlorvos
Dursban
Ethion
Guthion
Malathion
Mevinphos
Methyl Parathion
Methyl Trithion
Parathion
Phorate (Thimet)
Reldan
Ronnel
Carbofuran
Propoxur
IPC
Aminocarb
CIPC
Eptam
Benonyl
Bux
Diallate
Sevin
Sutan
Propazine
Atrazine
Simazine
Sencor (metribuzin)
Bladex (Cyanazine)
Prometone
Ametryne
Prometryne
Atratone
Alachlor
Metolachlor

ALVINSTON WATER SYSTEM

DRINKING WATER SURVEILLANCE PROGRAM

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ALVINSTON WATER SYSTEM

Location:	P.O. Box 29 Alvinston, Ontario NON 1A0 (519-898-2047)
Source:	Sydenham River
Design Capacity:	0.775 1000 M3/day
Operation:	Ministry of the Environment
Plant Superintendent:	T. Wright
Ministry Region:	Southwestern Region Sarnia District Office Suite 109, 265 N Front Street Sarnia, Ontario N7T 7X1 (519-336-4030)
Municipalities Served:	Alvinston (800)
Treatment Type:	Physical and chemical treatment consisting of coagulation, flocculation, clarification, (upflow clarifier) and filtration and disinfection as well as activated carbon adsorption,used on a seasonal basis.
Chemicals Used:	Carbon adsorption - powdered activated carbon Coagulation - alum liquid with polyelectrolyte Post chlorination - sodium hypochlorite

ALVINSTON WATER SYSTEM

EXECUTIVE SUMMARY
DRINKING WATER SURVEILLANCE PROGRAM, 1986

The Alvinston Water System was sampled 3 times in 1986; results are given for raw and treated samples.

The parameters analyzed fall into several categories: physical parameters and general chemistry, bacterial parameters, metals, and organic substances including volatile and chloroaromatic substances and pesticides.

The discussion of results focuses on health-related parameters found in treated water:

(a) **Organic Substances**

Analysis was carried out for approximately 110 organic compounds. The only volatile compounds found, trihalomethanes (THMs) were always present in treated waters; the highest level recorded for total THMs was 125 ug/L.

Of the pesticides analyzed for, only atrazine was found at 1830 ng/L in treated water.

No chlorophenolic compounds were analyzed for.

Only two other organic compounds were found at quantifiable levels in treated water at this supply; hexachloroethane was found only once at 10 ng/L, while 2,3,6-trichlorotoluene was found once at 69 ng/L.

(b) **Other Parameters**

The aesthetic ODWO* for organic nitrogen was exceeded in three treated water samples and that for total dissolved solids in one sample. Of the other physical, general chemistry and microbiological parameters and metals analyzed, for which there are health-related ODWO, none exceeded the objectives, in treated water.

The results of these analyses are consistent with those obtained in other areas of the Great Lakes.

The treated water from the supply did not exceed any known health-related guidelines for organic substances applicable to drinking water.

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* The Ontario Drinking Water Objectives, revised 1983.

ALVINSTON WATER SYSTEM

SUMMARY TABLE OF RESULTS
DRINKING WATER SURVEILLANCE PROGRAM, 1986

The Alvinston Water System was sampled 3 times in 1986.

PARAMETER CATEGORY	TYPE OF SAMPLE RAW	TREATED*
1. GENERAL CHEMISTRY - includes anions such as sulphate, field analyses such as chlorine residual and physical parameters such as colour.		
Total number of parameters in category: 21		
- Total number of analyses completed	54	54
- Total number of positive results	54	53
- **Number of times guidelines exceeded**	**N/A**	**4**
Guidelines exceeded - aesthetic ODWO** for organic nitrogen (3)		
- " " " total dissolved solids (1)		
2. METALS - includes metals such as copper and lead.		
Total number of parameters in category: 24		
- Total number of analyses completed	63	63
- Total number of positive results	37	35
- **Number of times guidelines exceeded**	**N/A**	**0**
3. BACTERIOLOGY - includes bacteria such as coliforms.		
Total number of parameters in category: 5		
- Total number of analyses completed	11	11
- Total number of positive results	10	1
- **Number of times guidelines exceeded**	**N/A**	**0**
4. VOLATILES - includes compounds such as benzene and toluene; also included in this category are trihalomethanes (5 parameters), acknowledged to be produced during water treatment.		
Total number of parameters in category: 29		
- Total number of analyses completed	82	82
- Total number of positive results	0	12
- **Number of times guidelines exceeded**	**N/A**	**0**
5. PESTICIDES -		
Total number of parameters possible in category: 65		
- Total number of analyses completed	77	77
- Total number of positive results	1	1
- **Number of times guidelines exceeded**	**N/A**	**0**
6. CHLOROAROMATICS AND CHLOROPHENOLS - includes a range of chlorinated organic compounds.		
Total number of parameters possible in category: 19		
- Total number of analyses completed	39	39
- Total number of positive results	0	2
- **Number of times guidelines exceeded**	**N/A**	**0**

* Total number of analyses completed will not always equal the number of parameters analyzed for multiplied by number of times the supply was sampled, because of accidents during shipping or analyses or analytical difficulties.

** Ontario Drinking Water Objective.

AMHERSTBURG AREA WATER SYSTEM

DRINKING WATER SURVEILLANCE PROGRAM

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AMHERSTBURG AREA WATER SYSTEM

Location:	415 Front Street North Amherstburg, Ontario N9V 2V5 (519-736-5447)
Source:	Detroit River, Amherstburg Channel
Design Capacity:	18.18 1000 M3/day
Operation:	Ministry of the Environment
Plant Superintendent:	L. Singer
Ministry Region:	Southwestern Region London Regional Office 985 Adelaide Street South London, Ontario N6E 1V3 (519-661-2200)
Municipalities Served:	Amherstburg (8,385) Township of Anderdon (3,822) Township of Malden (1,800) Township of Colchester North (1,944)
Treatment Type:	Physical and chemical treatment consisting of coagulation, flocculation, clarification, (upflow clarifier) and filtration, and disinfection as well as powdered activated carbon adsorption and fluoridation.
Chemicals Used:	Prechlorination - chlorine Carbon adsorption - powdered activated carbon Coagulation - alum liquid with polyelectrolyte Filtration - polyelectrolyte Post chlorination - chlorine Fluoridation - hydrofluosilicic acid

AMHERSTBURG AREA WATER SYSTEM

EXECUTIVE SUMMARY
DRINKING WATER SURVEILLANCE PROGRAM, 1986

The Amherstburg Area Water System was sampled 3 times after April 30, 1986; results are given for raw and treated samples.

The parameters analyzed fall into several categories: physical parameters and general chemistry, bacterial parameters, metals, and organic substances including volatile and chloroaromatic substances and pesticides.

The discussion of results focuses on health-related parameters found in treated water:

(a) **Organic Substances**

Analysis was carried out for approximately 110 organic compounds. The only volatile compounds found, trihalomethanes (THMs) were always present in treated waters; the highest level recorded for total THMs was 54 ug/L.

None of the pesticides analyzed for was found.

No chlorophenolic compounds were analyzed for.

Only one other organic compound was found on two occasions at quantifiable levels in treated water at this supply; this was hexachloroethane, found at 17 ng/L and 18 ng/L.

(b) **Other Parameters**

Of the physical, general chemistry and microbiological parameters and metals analyzed, for which there are health-related ODWO*, none exceeded the objectives, in treated water.

The results of these analyses are consistent with those obtained in other areas of the Great Lakes.

The treated water from the supply did not exceed any known health-related guidelines for organic substances applicable to drinking water.

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* The Ontario Drinking Water Objectives, revised 1983.

AMHERSTBURG AREA WATER SYSTEM

SUMMARY TABLE OF RESULTS
DRINKING WATER SURVEILLANCE PROGRAM, 1986

Amherstburg Area Water System was sampled 3 times after April 30, 1986.

PARAMETER CATEGORY	TYPE OF SAMPLE RAW	TREATED*
1. GENERAL CHEMISTRY - includes anions such as sulphate, field analyses such as chlorine residual and physical parameters such as colour.		
Total number of parameters in category: 21		
- Total number of analyses completed	54	54
- Total number of positive results	51	41
- **Number of times guidelines exceeded**	**N/A**	**0**
2. METALS - includes metals such as copper and lead.		
Total number of parameters in category: 29		
- Total number of analyses completed	62	63
- Total number of positive results	30	22
- **Number of times guidelines exceeded**	**N/A**	**0**
3. BACTERIOLOGY - includes bacteria such as coliforms.		
Total number of parameters in category: 5		
- Total number of analyses completed	12	11
- Total number of positive results	12	1
- **Number of times guidelines exceeded**	**N/A**	**0**
4. VOLATILES - includes compounds such as benzene and toluene; also included in this category are trihalomethanes (5 parameters), acknowledged to be produced during water treatment.		
Total number of parameters in category: 29		
- Total number of analyses completed	85	83
- Total number of positive results	0	12
- **Number of times guidelines exceeded**	**N/A**	**0**
5. PESTICIDES -		
Total number of parameters possible in category: 65		
- Total number of analyses completed	89	89
- Total number of positive results	0	0
- **Number of times guidelines exceeded**	**N/A**	**0**
6. CHLOROAROMATICS AND CHLOROPHENOLS - includes a range of chlorinated organic compounds.		
Total number of parameters possible in category: 19		
- Total number of analyses completed	39	39
- Total number of positive results	0	2
- **Number of times guidelines exceeded**	**N/A**	**0**

* Total number of analyses completed will not always equal the number of parameters analyzed for multiplied by number of times the supply was sampled, because of accidents during shipping or analyses or analytical difficulties.

** Ontario Drinking Water Objective.

BRITANNIA WATER TREATMENT PLANT

OTTAWA

DRINKING WATER SURVEILLANCE PROGRAM

ANNUAL REPORT - 1986

BRITANNIA WATER TREATMENT PLANT
OTTAWA

Location:	Cassels Road Ottawa, Ontario (613-828-2727)
Source:	Ottawa River
Design Capacity:	247.0 1000 M3/day
Operation:	Municipal
Plant Superintendent:	L. Scharfe
Ministry Region:	Southeastern Region Ottawa District Office 2378 Holly Lane Ottawa, Ontario K1V 7P1 (613-521-3450)
Municipalities Served:	Ottawa (304,000) Gloucester (76,589) Vanier (18,877) Nepean (85,737) Kanata (20,529) Goulbourn (9,720)
Treatment Type:	Physical and chemical treatment consisting of coagulation, flocculation, sedimentation and filtration, (conventional) and disinfection as well as post pH adjustment and fluoridation.
Chemicals Used:	Prechlorination - chlorine Coagulation - alum liquid with activated silica (sodium silicate activated with alum) Post chlorination - chlorine Post pH adjustment - calcium carbonate Fluoridation - hydrofluosilicic acid

BRITANNIA WATER TREATMENT PLANT
OTTAWA

EXECUTIVE SUMMARY
DRINKING WATER SURVEILLANCE PROGRAM, 1986

The Britannia Water Treatment Plant, Ottawa was sampled 4 times in 1986; results are given for raw and treated samples.

The parameters analyzed fall into several categories: physical parameters and general chemistry, bacterial parameters, metals, and organic substances including volatile and chloroaromatic substances and pesticides.

The discussion of results focuses on health-related parameters found in treated water:

(a) **Organic Substances**

Analysis was carried out for approximately 110 organic compounds. The only volatile compounds found, trihalomethanes (THMs) were always present in treated waters; the highest level recorded for total THMs was 206 ug/L.

None of the pesticides analyzed for was found.

No chlorophenolic or chloroaromatic compounds were found.

(b) **Other Parameters**

The aesthetic ODWO* for organic nitrogen was exceeded in one treated water sample as was the ODWO for turbidity. Of the other physical, general chemistry and microbiological parameters and metals analyzed, for which there are health-related ODWO, none exceeded the objectives, in treated water.

The results of these analyses are consistent with those obtained in other areas of the Great Lakes.

The treated water from the supply did not exceed any known health-related guidelines for organic substances applicable to drinking water.

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* The Ontario Drinking Water Objectives, revised 1983.

BRITANNIA WATER TREATMENT PLANT
OTTAWA

SUMMARY TABLE OF RESULTS
DRINKING WATER SURVEILLANCE PROGRAM, 1986

Britannia Water Treatment Plant was sampled 4 times in 1986.

PARAMETER CATEGORY	TYPE OF SAMPLE RAW	TREATED*
1. GENERAL CHEMISTRY - includes anions such as sulphate, field analyses such as chlorine residual and physical parameters such as colour.		
Total number of parameters in category: 21		
- Total number of analyses completed	72	72
- Total number of positive results	64	57
- **Number of times guidelines exceeded**	**N/A**	**2**
Guidelines exceeded - aesthetic ODWO** for organic nitrogen (1)		
- ODWO for turbidity (1)		
2. METALS - includes metals such as copper and lead.		
Total number of parameters in category: 24		
- Total number of analyses completed	88	88
- Total number of positive results	35	35
- **Number of times guidelines exceeded**	**N/A**	**0**
3. BACTERIOLOGY - includes bacteria such as coliforms.		
Total number of parameters in category: 5		
- Total number of analyses completed	16	16
- Total number of positive results	15	2
- **Number of times guidelines exceeded**	**N/A**	**0**
4. VOLATILES - includes compounds such as benzene and toluene; also included in this category are trihalomethanes (5 parameters), acknowledged to be produced during water treatment.		
Total number of parameters in category: 29		
- Total number of analyses completed	114	114
- Total number of positive results	0	12
- **Number of times guidelines exceeded**	**N/A**	**0**
5. PESTICIDES -		
Total number of parameters possible in category: 65		
- Total number of analyses completed	169	169
- Total number of positive results	0	0
- **Number of times guidelines exceeded**	**N/A**	**0**
6. CHLOROAROMATICS AND CHLOROPHENOLS - includes a range of chlorinated organic compounds.		
Total number of parameters possible in category: 19		
- Total number of analyses completed	58	58
- Total number of positive results	0	0
- **Number of times guidelines exceeded**	**N/A**	**0**

* Total number of analyses completed will not always equal the number of parameters analyzed for multiplied by number of times the supply was sampled, because of accidents during shipping or analyses or analytical difficulties.

** Ontario Drinking Water Objective.

R.L. CLARK WATER TREATMENT PLANT

TORONTO

DRINKING WATER SURVEILLANCE PROGRAM

ANNUAL REPORT - 1986

R. L. CLARK WATER TREATMENT PLANT
TORONTO

Location:	45 23rd Street Toronto, Ontario M8V 3M6 (416-252-1611)
Source:	Lake Ontario
Design Capacity:	455 1000 M3/day
Operation:	Municipal
Plant Superintendent:	W. G. McEachern
Ministry Region:	Central Region Toronto Regional Office 7 Overlea Blvd. Toronto, Ontario M4H 1A8 (416-424-3000)
Municipalities Served:	City of Toronto (615,000) City of Etobicoke (298,490) City of North York (556,308) City of Scarborough (461,957) City of York (133,856) Borough of East York (97,679) Region of York (South) (170,000)
Treatment Type:	Physical and chemical treatment consisting of coagulation, flocculation, sedimentation and filtration (conventional) and disinfection as well as fluoridation.
Chemicals Used:	Prechlorination - chlorine Coagulation - alum liquid Dechlorination - sulphur dioxide Post chlorination - chlorination with chlorine and anhydrous ammonium Fluoridation - hydrofluosilicic acid

R.L. CLARK WATER TREATMENT PLANT
TORONTO

EXECUTIVE SUMMARY
DRINKING WATER SURVEILLANCE PROGRAM, 1986

The R.L. Clark Water Treatment Plant, Toronto was sampled 8 times in 1986; results are given for raw and treated samples.

The parameters analyzed fall into several categories: physical parameters and general chemistry, bacterial parameters, metals, and organic substances including volatile and chloroaromatic substances and pesticides.

The discussion of results focuses on health-related parameters found in treated water:

(a) **Organic Substances**

Analysis was carried out for approximately 110 organic compounds. The only volatile compounds found, trihalomethanes (THMs) were always present in treated waters; the highest level recorded for total THMs was 39 ug/L.

None of the pesticides analyzed for was found.

No chlorophenolic or chloroaromatic compounds were found.

(b) **Other Parameters**

The aesthetic ODWO* for organic nitrogen was exceeded in five treated water samples. Of the other physical, general chemistry and microbiological parameters and metals analyzed, for which there are health-related ODWO, none exceeded the objectives, in treated water.

The results of these analyses are consistent with those obtained in other areas of the Great Lakes.

The treated water from the supply did not exceed any known health-related guidelines for organic substances applicable to drinking water.

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* The Ontario Drinking Water Objectives, revised 1983.

R.L. CLARK WATER TREATMENT PLANT
TORONTO

SUMMARY TABLE OF RESULTS
DRINKING WATER SURVEILLANCE PROGRAM, 1986

The R.L. Clark Water Treatment Plant, Toronto was sampled 8 times in 1986.

PARAMETER CATEGORY	TYPE OF SAMPLE RAW	TREATED*
1. GENERAL CHEMISTRY - includes anions such as sulphate, field analyses such as chlorine residual and physical parameters such as colour.		
Total number of parameters in category: 21		
- Total number of analyses completed	144	133
- Total number of positive results	134	108
- **Number of times guidelines exceeded**	**N/A**	**5**
Guidelines exceeded - aesthetic ODWO** for organic nitrogen (5)		
2. METALS - includes metals such as copper and lead.		
Total number of parameters in category: 24		
- Total number of analyses completed	173	173
- Total number of positive results	93	86
- **Number of times guidelines exceeded**	**N/A**	**0**
3. BACTERIOLOGY - includes bacteria such as coliforms.		
Total number of parameters in category: 5		
- Total number of analyses completed	31	41
- Total number of positive results	29	11
- **Number of times guidelines exceeded**	**N/A**	**0**
4. VOLATILES - includes compounds such as benzene and toluene; also included in this category are trihalomethanes (5 parameters), acknowledged to be produced during water treatment.		
Total number of parameters in category: 29		
- Total number of analyses completed	226	226
- Total number of positive results	0	31
- **Number of times guidelines exceeded**	**N/A**	**0**
5. PESTICIDES -		
Total number of parameters possible in category: 65		
- Total number of analyses completed	299	299
- Total number of positive results	0	0
- **Number of times guidelines exceeded**	**N/A**	**0**
6. CHLOROAROMATICS AND CHLOROPHENOLS - includes a range of chlorinated organic compounds.		
Total number of parameters possible in category: 19		
- Total number of analyses completed	116	116
- Total number of positive results	0	0
- **Number of times guidelines exceeded**	**N/A**	**0**

* Total number of analyses completed will not always equal the number of parameters analyzed for multiplied by number of times the supply was sampled, because of accidents during shipping or analyses or analytical difficulties.

** Ontario Drinking Water Objective.

DRESDEN WATER TREATMENT PLANT

DRINKING WATER SURVEILLANCE PROGRAM

ANNUAL REPORT - 1986

DRESDEN WATER TREATMENT PLANT

Location:	749 Peel Street, P.O. Box 1120 Dresden, Ontario N0P 1M0 (519-683-6103)
Source:	Sydenham River
Design Capacity:	3.819 1000 M3/day
Operation:	Ministry of the Environment
Plant Superintendent:	C. Sherman
Ministry Region:	Southwestern Region Sarnia District Office Suite 109, 265 N. Front Street Sarnia, Ontario N7T 7X1 (519-336-4030)
Municipalities Served:	Dresden (2,504) (Canadian Canners)
Treatment Type:	Physical and chemical treatment consisting of coagulation, flocculation, and direct filtration and disinfection as well as activated carbon adsorption and taste and odour control.
Chemicals Used:	Prechlorination - chlorine Adsorption - powdered activated carbon Coagulation - dry alum with activated silica (sodium silicate and sodium bicarbonate) Post chlorination - chlorine Taste & odour - potassium permanganate.

DRESDEN WATER TREATMENT PLANT

EXECUTIVE SUMMARY
DRINKING WATER SURVEILLANCE PROGRAM, 1986

The Dresden Water Treatment Plant was sampled 6 times in 1986; results are given for raw and treated samples.

The parameters analyzed fall into several categories: physical parameters and general chemistry, bacterial parameters, metals, and organic substances including volatile and chloroaromatic substances and pesticides.

The discussion of results focuses on health-related parameters found in treated water:

(a) **Organic Substances**

Analysis was carried out for approximately 110 organic compounds. The only volatile compounds found, trihalomethanes (THMs) were always present in treated waters; the highest level recorded for total THMs was 134 ug/L.

Of all the pesticides analyzed for only atrazine was found, occurring in raw water three times and in treated water at 1135 ng/L only once.

No chlorophenolic compounds were found.

Only two other organic compounds were found at quantifiable levels in treated water; they each occurred on only one occasion, hexachloroethane at 17 ng/L and 2,3,6-trichlorotoluene at 66 ng/L.

(b) **Other Parameters**

The aesthetic ODWO* for organic nitrogen was exceeded in six treated water samples, while the ODWO both for colour and total solids was exceeded on two occasions. Of the other physical, general chemistry and microbiological parameters and metals analyzed, for which there are health-related ODWO, none exceeded the objectives, in treated water.

The results of these analyses are consistent with those obtained in other areas of the Great Lakes.

The treated water from the supply did not exceed any known health-related guidelines for organic substances applicable to drinking water.

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* The Ontario Drinking Water Objectives, revised 1983.

DRESDEN WATER TREATMENT PLANT

SUMMARY TABLE OF RESULTS
DRINKING WATER SURVEILLANCE PROGRAM, 1986

The Dresden Water Treatment Plant was sampled 6 times in 1986.

PARAMETER CATEGORY	TYPE OF SAMPLE RAW	TREATED*
1. GENERAL CHEMISTRY - includes anions such as sulphate, field analyses such as chlorine residual and physical parameters such as colour.		
Total number of parameters in category: 21		
- Total number of analyses completed	108	108
- Total number of positive results	108	87
- **Number of times guidelines exceeded**	**N/A**	**10**
Guidelines exceeded - aesthetic ODWO** for organic nitrogen (6)		
- " " " colour (2)		
- " " " total solids (2)		
2. METALS - includes metals such as copper and lead.		
Total number of parameters in category: 24		
- Total number of analyses completed	126	127
- Total number of positive results	70	62
- **Number of times guidelines exceeded**	**N/A**	**0**
3. BACTERIOLOGY - includes bacteria such as coliforms.		
Total number of parameters in category: 5		
- Total number of analyses completed	22	24
- Total number of positive results	20	6
- **Number of times guidelines exceeded**	**N/A**	**0**
4. VOLATILES - includes compounds such as benzene and toluene; also included in this category are trihalomethanes (5 parameters), acknowledged to be produced during water treatment.		
Total number of parameters in category: 29		
- Total number of analyses completed	167	166
- Total number of positive results	3	24
- **Number of times guidelines exceeded**	**N/A**	**0**
5. PESTICIDES -		
Total number of parameters possible in category: 65		
- Total number of analyses completed	185	185
- Total number of positive results	3	1
- **Number of times guidelines exceeded**	**N/A**	**0**
6. CHLOROAROMATICS AND CHLOROPHENOLS - includes a range of chlorinated organic compounds.		
Total number of parameters possible in category: 19		
- Total number of analyses completed	89	89
- Total number of positive results	1	2
- **Number of times guidelines exceeded**	**N/A**	**0**

* Total number of analyses completed will not always equal the number of parameters analyzed for multiplied by number of times the supply was sampled, because of accidents during shipping or analyses or analytical difficulties.

** Ontario Drinking Water Objective.

EASTERLY WATER TREATMENT PLANT

TORONTO

DRINKING WATER SURVEILLANCE PROGRAM

ANNUAL REPORT - 1986

EASTERLY WATER TREATMENT PLANT
TORONTO

Location:	201 Copperfield Road West Hill, Ontario M1Z 4S1 (416-281-2888)
Source:	Lake Ontario
Design Capacity:	454.6 1000 M3/day
Operation:	Municipal
Plant Superintendent:	W. Reddock
Ministry Region:	Central Region Toronto Regional Office 7 Overlea Blvd Toronto, Ont. M4H 1A8 (416-424-3000)
Municipalities Served:	City of Toronto (615,000) City of Etobicoke (298,490) City of North York (556,308) City of Scarborough (461,957) City of York (133,856) Borough of East York (97,679) Region of York (South) (170,000)
Treatment Type:	Physical and chemical treatment consisting of coagulation, flocculation, and direct filtration and disinfection as well as fluoridation.
Chemicals Used:	Prechlorination - chlorine Coagulation - alum liquid Dechlorination - sulphur dioxide Post chlorination - chlorination with chlorine and ammonia Fluoridation - hydrofluosilicic acid

EASTERLY WATER TREATMENT PLANT
TORONTO

EXECUTIVE SUMMARY
DRINKING WATER SURVEILLANCE PROGRAM, 1986

The Easterly Water Treatment Plant, Toronto was sampled 8 times in 1986; results are given for raw and treated samples.

The parameters analyzed fall into several categories: physical parameters and general chemistry, bacterial parameters, metals, and organic substances including volatile and chloroaromatic substances and pesticides.

The discussion of results focuses on health-related parameters found in treated water:

(a) **Organic Substances**

Analysis was carried out for approximately 110 organic compounds. The only volatile compounds found, trihalomethanes (THMs) were always present in treated waters; the highest level recorded for total THMs was 23 ug/L.

None of the pesticides analyzed for was found.

No chlorophenolic or chloroaromatic compounds were found.

(b) **Other Parameters**

The aesthetic ODWO* for organic nitrogen was exceeded in five treated water samples. Of the other physical, general chemistry and microbiological parameters and metals analyzed, for which there are health-related ODWO, none exceeded the objectives, in treated water.

The results of these analyses are consistent with those obtained in other areas of the Great Lakes.

The treated water from the supply did not exceed any known health-related guidelines for organic substances applicable to drinking water.

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* The Ontario Drinking Water Objectives, revised 1983.

EASTERLY WATER TREATMENT PLANT
TORONTO

SUMMARY TABLE OF RESULTS
DRINKING WATER SURVEILLANCE PROGRAM, 1986

The Easterly Water Treatment Plant, Toronto was sampled 8 times in 1986.

PARAMETER CATEGORY	TYPE OF SAMPLE RAW	TREATED*
1. GENERAL CHEMISTRY - includes anions such as sulphate, field analyses such as chlorine residual and physical parameters such as colour.		
Total number of parameters in category: 21		
- Total number of analyses completed	144	144
- Total number of positive results	129	117
- **Number of times guidelines exceeded**	**N/A**	**5**
Guidelines exceeded - aesthetic ODWO** for organic nitrogen (5)		
2. METALS - includes metals such as copper and lead.		
Total number of parameters in category: 24		
- Total number of analyses completed	174	174
- Total number of positive results	86	75
- **Number of times guidelines exceeded**	**N/A**	**0**
3. BACTERIOLOGY - includes bacteria such as coliforms.		
Total number of parameters in category: 5		
- Total number of analyses completed	32	37
- Total number of positive results	31	6
- **Number of times guidelines exceeded**	**N/A**	**0**
4. VOLATILES - includes compounds such as benzene and toluene; also included in this category are trihalomethanes (5 parameters), acknowledged to be produced during water treatment.		
Total number of parameters in category: 29		
- Total number of analyses completed	226	226
- Total number of positive results	0	31
- **Number of times guidelines exceeded**	**N/A**	**0**
5. PESTICIDES -		
Total number of parameters possible in category: 65		
- Total number of analyses completed	291	268
- Total number of positive results	0	0
- **Number of times guidelines exceeded**	**N/A**	**0**
6. CHLOROAROMATICS AND CHLOROPHENOLS - includes a range of chlorinated organic compounds.		
Total number of parameters possible in category: 19		
- Total number of analyses completed	116	103
- Total number of positive results	0	0
- **Number of times guidelines exceeded**	**N/A**	**0**

* Total number of analyses completed will not always equal the number of parameters analyzed for multiplied by number of times the supply was sampled, because of accidents during shipping or analyses or analytical difficulties.

** Ontario Drinking Water Objective.

HAMILTON WATER TREATMENT PLANT

DRINKING WATER SURVEILLANCE PROGRAM

ANNUAL REPORT - 1986

HAMILTON WATER TREATMENT PLANT

Location:	900 Woodward Avenue Hamilton, Ontario L8H 7N2 (416-256-4408)
Source:	Lake Ontario
Design Capacity:	909 1000 M3/day
Operation:	Municipal
Plant Superintendent:	J. Halliday
Ministry Region:	West Central Region Hamilton Regional Office 119 King Street West, Box 2112, 12th Floor Hamilton, Ontario L8N 3Z9 (416-521-7640)
Municipalities Served:	Ancaster Town (16,542) Dundas Town (20,081) Hamilton City (307,690) Stoney Creek Town (41,964) Waterdown (25,541)
Treatment Type:	Physical and chemical treatment consisting of coagulation, flocculation, sedimentation and filtration, (conventional) and disinfection as well as fluoridation.
Chemicals Used:	Prechlorination - chlorine Coagulation - alum liquid Dechlorination - sulphur dioxide Post chlorination - chlorination with chlorine and anhydrous ammonium Fluoridation - hydrofluosilicic acid

HAMILTON WATER TREATMENT PLANT

EXECUTIVE SUMMARY
DRINKING WATER SURVEILLANCE PROGRAM, 1986

The Hamilton Water Treatment Plant was sampled 5 times in 1986; results are given for raw and treated samples.

The parameters analyzed fall into several categories: physical parameters and general chemistry, bacterial parameters, metals, and organic substances including volatile and chloroaromatic substances and pesticides.

The discussion of results focuses on health-related parameters found in treated water:

(a) **Organic Substances**

Analysis was carried out for approximately 110 organic compounds. The only volatile compounds found, trihalomethanes (THMs) were always present in treated waters; the highest level recorded for total THMs was 29 ug/L.

None of the pesticides analyzed for was found.

No chlorophenolic or chloroaromatic compounds were found.

(b) **Other Parameters**

The aesthetic ODWO* for organic nitrogen was exceeded in two treated water samples. Of the other physical, general chemistry and microbiological parameters and metals analyzed, for which there are health-related ODWO, none exceeded the objectives, in treated water.

The results of tnese analyses are consistent with those obtained in other areas of the Great Lakes.

The treated water from the supply did not exceed any known health-related guidelines for organic substances applicable to drinking water.

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* The Ontario Drinking Water Objectives, revised 1983.

HAMILTON WATER TREATMENT PLANT

SUMMARY TABLE OF RESULTS
DRINKING WATER SURVEILLANCE PROGRAM, 1986

The Hamilton Water Treatment Plant was sampled 5 times in 1986.

PARAMETER CATEGORY	TYPE OF SAMPLE RAW	TREATED*
1. GENERAL CHEMISTRY - includes anions such as sulphate, field analyses such as chlorine residual and physical parameters such as colour.		
Total number of parameters in category: **21**		
- Total number of analyses completed	90	90
- Total number of positive results	82	72
- **Number of times guidelines exceeded**	**N/A**	**2**
Guidelines exceeded - aesthetic ODWO** for organic nitrogen (2)		
2. METALS - includes metals such as copper and lead.		
Total number of parameters in category: **24**		
- Total number of analyses completed	108	108
- Total number of positive results	58	54
- **Number of times guidelines exceeded**	**N/A**	**0**
3. BACTERIOLOGY - includes bacteria such as coliforms.		
Total number of parameters in category: **5**		
- Total number of analyses completed	20	20
- Total number of positive results	15	1
- **Number of times guidelines exceeded**	**N/A**	**0**
4. VOLATILES - includes compounds such as benzene and toluene; also included in this category are trihalomethanes (5 parameters), acknowledged to be produced during water treatment.		
Total number of parameters in category: **29**		
- Total number of analyses completed	140	141
- Total number of positive results	4	16
- **Number of times guidelines exceeded**	**N/A**	**0**
5. PESTICIDES -		
Total number of parameters possible in category: **65**		
- Total number of analyses completed	180	180
- Total number of positive results	0	0
- **Number of times guidelines exceeded**	**N/A**	**0**
6. CHLOROAROMATICS AND CHLOROPHENOLS - includes a range of chlorinated organic compounds.		
Total number of parameters possible in category: **19**		
- Total number of analyses completed	71	71
- Total number of positive results	0	0
- **Number of times guidelines exceeded**	**N/A**	**0**

* Total number of analyses completed will not always equal the number of parameters analyzed for multiplied by number of times the supply was sampled, because of accidents during shipping or analyses or analytical difficulties.

** Ontario Drinking Water Objective.

R.C. HARRIS WATER TREATMENT PLANT

TORONTO

DRINKING WATER SURVEILLANCE PROGRAM

ANNUAL REPORT - 1986

R. C. HARRIS WATER TREATMENT PLANT
TORONTO

Location:	2701 Queen Street East Toronto, Ontario M4E 1J1 (416-694-3237)
Source:	Lake Ontario
Design Capacity:	1000 1000 M3/day
Operation:	Municipal
Plant Superintendent:	A. Mackenzie
Ministry Region:	Central Region Toronto Regional Office 7 Overlea Blvd. Toronto, Ontario M4H 1A8 (416-424-3000)
Municipalities Served:	City of Toronto (615,000) City of Etobicoke (295,490) City of North York (556,308) City of Scarborough (461,957) City of York (133,856) Borough of East York (97,679) Region of York (South) (170,000)
Treatment Type:	Physical and chemical treatment consisting of coagulation, flocculation, sedimentation and filtration (conventional) and disinfection as well as fluoridation.
Chemicals Used:	Prechlorination - chlorine Coagulation - alum liquid Dechlorination - sulphur dioxide Post chlorination - chlorination with chlorine and anhydrous ammonium Fluoridation - hydrofluosilicic acid

R.C. HARRIS WATER TREATMENT PLANT
TORONTO

EXECUTIVE SUMMARY
DRINKING WATER SURVEILLANCE PROGRAM, 1986

The R.C. Harris Water Treatment Plant, Toronto was sampled 8 times in 1986; results are given for raw and treated samples.

The parameters analyzed fall into several categories: physical parameters and general chemistry, bacterial parameters, metals, and organic substances including volatile and chloroaromatic substances and pesticides.

The discussion of results focuses on health-related parameters found in treated water:

(a) **Organic Substances**

Analysis was carried out for approximately 110 organic compounds. The only volatile compounds found, trihalomethanes (THMs) were always present in treated waters; the highest level recorded for total THMs was 44 ug/L.

None of the pesticides analyzed for was found.

No chlorophenolic compounds were found.

Only one other organic compound was found at quantifiable levels in treated water at this supply; this was hexachloroethane (11 ng/L).

(b) **Other Parameters**

The aesthetic ODWO* for organic nitrogen was exceeded in five treated water samples. Of the other physical, general chemistry and microbiological parameters and metals analyzed, for which there are health-related ODWO, none exceeded the objectives, in treated water.

The results of these analyses are consistent with those obtained in other areas of the Great Lakes.

The treated water from the supply did not exceed any known health-related guidelines for organic substances applicable to drinking water.

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* The Ontario Drinking Water Objectives, revised 1983.

R.C. HARRIS WATER TREATMENT PLANT
TORONTO

SUMMARY TABLE OF RESULTS
DRINKING WATER SURVEILLANCE PROGRAM, 1986

The R.C. Harris Water Treatment Plant, Toronto was sampled 8 times in 1986.

PARAMETER CATEGORY	TYPE OF SAMPLE RAW	TREATED*
1. GENERAL CHEMISTRY - includes anions such as sulphate, field analyses such as chlorine residual and physical parameters such as colour.		
Total number of parameters in category: 21		
- Total number of analyses completed	144	144
- Total number of positive results	130	120
- **Number of times guidelines exceeded**	**N/A**	**5**
Guidelines exceeded - aesthetic ODWO** for organic nitrogen (5)		
2. METALS - includes metals such as copper and lead.		
Total number of parameters in category: 24		
- Total number of analyses completed	173	173
- Total number of positive results	90	78
- **Number of times guidelines exceeded**	**N/A**	**0**
3. BACTERIOLOGY - includes bacteria such as coliforms.		
Total number of parameters in category: 5		
- Total number of analyses completed	32	32
- Total number of positive results	31	5
- **Number of times guidelines exceeded**	**N/A**	**0**
4. VOLATILES - includes compounds such as benzene and toluene; also included in this category are trihalomethanes (5 parameters), acknowledged to be produced during water treatment.		
Total number of parameters in category: 29		
- Total number of analyses completed	226	226
- Total number of positive results	4	27
- **Number of times guidelines exceeded**	**N/A**	**0**
5. PESTICIDES -		
Total number of parameters possible in category: 65		
- Total number of analyses completed	299	276
- Total number of positive results	0	0
- **Number of times guidelines exceeded**	**N/A**	**0**
6. CHLOROAROMATICS AND CHLOROPHENOLS - includes a range of chlorinated organic compounds.		
Total number of parameters possible in category: 19		
- Total number of analyses completed	116	103
- Total number of positive results	0	1
- **Number of times guidelines exceeded**	**N/A**	**0**

* Total number of analyses completed will not always equal the number of parameters analyzed for multiplied by number of times the supply was sampled, because of accidents during shipping or analyses or analytical difficulties.

** Ontario Drinking Water Objective.

HARROW-COLCHESTER SOUTH WATER SUPPLY SYSTEM

DRINKING WATER SURVEILLANCE PROGRAM

ANNUAL REPORT - 1986

HARROW-COLCHESTER SOUTH WATER SUPPLY SYSTEM

Location:	P.O. Box 909 Harrow, Ontario N6R 1G0 (519-738-3038)
Source:	Lake Erie
Design Capacity:	10.229 1000 M3/day
Operation:	Ministry of the Environment
Plant Superintendent:	G. E. Johnston
Ministry Region:	Southwestern Region London Regional Office 985 Adelaide Street South London, Ontario N6E 1V3 (519-661-2200)
Municipalities Served:	Town of Harrow (2,281) Colchester Township (1,047)
Treatment Type:	Physical and chemical treatment consisting of coagulation, flocculation, clarification (upflow clarifier) and filtration, with disinfection as well as activated carbon adsorption.
Chemicals Used:	Adsorption - powdered activated carbon Coagulation - alum liquid with polyelectrolyte Post chlorination - chlorine

HARROW-COLCHESTER SOUTH WATER SUPPLY SYSTEM

EXECUTIVE SUMMARY
DRINKING WATER SURVEILLANCE PROGRAM, 1986

The Harrow-Colchester South Water Supply System was sampled 5 times in 1986; results are given for raw and treated samples.

The parameters analyzed fall into several categories: physical parameters and general chemistry, bacterial parameters, metals, and organic substances including volatile and chloroaromatic substances and pesticides.

The discussion of results focuses on health-related parameters found in treated water:

(a) **Organic Substances**

Analysis was carried out for approximately 110 organic compounds. The only volatile compounds found, trihalomethanes (THMs) were always present in treated waters; the highest level recorded for total THMs was 41 ug/L.

None of the pesticides analyzed for was found.

No chlorophenolic or chloroaromatic compounds were found.

(b) **Other Parameters**

Of the physical, general chemistry and microbiological parameters and metals analyzed, for which there are health-related ODWO*, none exceeded the objectives, in treated water.

The results of these analyses are consistent with those obtained in other areas of the Great Lakes.

The treated water from the supply did not exceed any known health-related guidelines for organic substances applicable to drinking water.

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* The Ontario Drinking Water Objectives, revised 1983.

HARROW-COLCHESTER SOUTH WATER SUPPLY SYSTEM

SUMMARY TABLE OF RESULTS
DRINKING WATER SURVEILLANCE PROGRAM, 1986

The Harrow-Colchester South Water Supply System was sampled 5 times in 1986.

PARAMETER CATEGORY	TYPE OF SAMPLE RAW	TREATED*
1. GENERAL CHEMISTRY - includes anions such as sulphate, field analyses such as chlorine residual and physical parameters such as colour.		
Total number of parameters in category: 21		
- Total number of analyses completed	90	90
- Total number of positive results	86	68
- **Number of times guidelines exceeded**	**N/A**	**0**
2. METALS - includes metals such as copper and lead.		
Total number of parameters in category: 24		
- Total number of analyses completed	106	106
- Total number of positive results	47	40
- **Number of times guidelines exceeded**	**N/A**	**0**
3. BACTERIOLOGY - includes bacteria such as coliforms.		
Total number of parameters in category: 5		
- Total number of analyses completed	20	20
- Total number of positive results	16	4
- **Number of times guidelines exceeded**	**N/A**	**0**
4. VOLATILES - includes compounds such as benzene and toluene; also included in this category are trihalomethanes (5 parameters), acknowledged to be produced during water treatment.		
Total number of parameters in category: 29		
- Total number of analyses completed	141	141
- Total number of positive results	0	20
- **Number of times guidelines exceeded**	**N/A**	**0**
5. PESTICIDES -		
Total number of parameters possible in category: 65		
- Total number of analyses completed	148	148
- Total number of positive results	0	0
- **Number of times guidelines exceeded**	**N/A**	**0**
6. CHLOROAROMATICS AND CHLOROPHENOLS - includes a range of chlorinated organic compounds.		
Total number of parameters possible in category: 19		
- Total number of analyses completed	71	71
- Total number of positive results	0	0
- **Number of times guidelines exceeded**	**N/A**	**0**

* Total number of analyses completed will not always equal the number of parameters analyzed for multiplied by number of times the supply was sampled, because of accidents during shipping or analyses or analytical difficulties.

** Ontario Drinking Water Objective.

KINGSTON WATER TREATMENT PLANT

DRINKING WATER SURVEILLANCE PROGRAM

ANNUAL REPORT - 1986

KINGSTON WATER TREATMENT PLANT

Location:	302 King Street West Kingston, Ontario K7L 2X1 (613-542-1763)
Source:	Lake Ontario
Design Capacity:	94.4 1000 M3/day
Operation:	Municipal
Plant Superintendent:	K. Allen
Ministry Region:	Southeastern Region Kingston Regional Office 133 Dalton Avenue, P.O. Box 820 Kingston, Ontario K7L 4X6 (613-549-4000)
Municipalities Served:	Kingston (60,500) Part of Pittsburgh Township (1,600) CFB, Kingston (4,500)
Treatment Type:	Physical and chemical treatment consisting of coagulation, flocculation, sedimentation and filtration (conventional) and disinfection.
Chemicals Used:	Prechlorination - chlorine Coagulation - alum liquid Dechlorination - sulphur dioxide Post chlorination - chlorine

KINGSTON WATER TREATMENT PLANT

EXECUTIVE SUMMARY
DRINKING WATER SURVEILLANCE PROGRAM, 1986

The Kingston Water Treatment Plant was sampled 13 times in 1986; results are given for raw and treated samples.

The parameters analyzed fall into several categories: physical parameters and general chemistry, bacterial parameters, metals, and organic substances including volatile and chloroaromatic substances and pesticides.

The discussion of results focuses on health-related parameters found in treated water:

(a) **Organic Substances**

Analysis was carried out for approximately 110 organic compounds. The only volatile compounds found, trihalomethanes (THMs) were always present in treated waters; the highest level recorded for total THMs was 51 ug/L.

None of the pesticides analyzed for was found.

No chlorophenolic or chloroaromatic compounds were found.

(b) **Other Parameters**

The aesthetic ODWO* for organic nitrogen was exceeded in six treated water samples; the ODWO for turbidity was exceeded marginally once. Of the other physical, general chemistry and microbiological parameters and metals analyzed, for which there are health-related ODWO, none exceeded the objectives, in treated water.

The results of these analyses are consistent with those obtained in other areas of the Great Lakes.

The treated water from the supply did not exceed any known health-related guidelines for organic substances applicable to drinking water.

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* The Ontario Drinking Water Objectives, revised 1983.

KINGSTON WATER TREATMENT PLANT

SUMMARY TABLE OF RESULTS
DRINKING WATER SURVEILLANCE PROGRAM, 1986

The Kingston Water Treatment Plant was sampled 13 times in 1986.

PARAMETER CATEGORY	TYPE OF SAMPLE RAW	TREATED*
1. GENERAL CHEMISTRY - includes anions such as sulphate, field analyses such as chlorine residual and physical parameters such as colour.		
Total number of parameters in category: 21		
- Total number of analyses completed	234	234
- Total number of positive results	214	165
- **Number of times guidelines exceeded**	**N/A**	**7**
Guidelines exceeded - aesthetic ODWO** for organic nitrogen (6) - ODWO for turbidity (1)		
2. METALS - includes metals such as copper and lead.		
Total number of parameters in category: 24		
- Total number of analyses completed	279	279
- Total number of positive results	137	128
- **Number of times guidelines exceeded**	**N/A**	**0**
3. BACTERIOLOGY - includes bacteria such as coliforms.		
Total number of parameters in category: 5		
- Total number of analyses completed	48	52
- Total number of positive results	37	10
- **Number of times guidelines exceeded**	**N/A**	**0**
4. VOLATILES - includes compounds such as benzene and toluene; also included in this category are trihalomethanes (5 parameters), acknowledged to be produced during water treatment.		
Total number of parameters in category: 29		
- Total number of analyses completed	364	365
- Total number of positive results	0	48
- **Number of times guidelines exceeded**	**N/A**	**0**
5. PESTICIDES -		
Total number of parameters possible in category: 65		
- Total number of analyses completed	430	430
- Total number of positive results	0	0
- **Number of times guidelines exceeded**	**N/A**	**0**
6. CHLOROAROMATICS AND CHLOROPHENOLS - includes a range of chlorinated organic compounds.		
Total number of parameters possible in category: 19		
- Total number of analyses completed	181	181
- Total number of positive results	0	0
- **Number of times guidelines exceeded**	**N/A**	**0**

* Total number of analyses completed will not always equal the number of parameters analyzed for multiplied by number of times the supply was sampled, because of accidents during shipping or analyses or analytical difficulties.

** Ontario Drinking Water Objective.

LAKE HURON WATER SUPPLY SYSTEM

DRINKING WATER SURVEILLANCE PROGRAM

ANNUAL REPORT - 1986

LAKE HURON WATER SUPPLY SYSTEM

Location:	P.O. Box 40 Grand Bend, Ontario NOM 1TO (519-238-8466)
Source:	Lake Huron
Design Capacity:	345.5 1000 M3/day
Operation:	Ministry of the Environment
Plant Superintendent:	A. Scott
Ministry Region:	Southwestern Region Sarnia District Office Suite 109, 265 N. Front Street Sarnia, Ontario N7T 7X1 (519-336-4030)
Municipalities Served:	City of London (260,000) Village of Ilderton (4,765) Village of Ailsa Craig (831) Town of Parkhill (1,347) London Township (1,958) McGillivray Township (1,820) Stephen Township (4,204) West Williams Township (952)
Treatment Type:	Physical and chemical treatment consisting of coagulation, flocculation, sedimentation and filtration (conventional) and disinfection as well as fluoridation.
Chemicals Used:	Prechlorination - chlorine Coagulation - alum liquid with polyelectrolyte Post chlorination - chlorine Fluoridation - hydrofluosilicic acid

LAKE HURON WATER SUPPLY SYSTEM

EXECUTIVE SUMMARY
DRINKING WATER SURVEILLANCE PROGRAM, 1986

The Lake Huron Water Supply System was sampled 7 times in 1986; results are given for raw and treated samples.

The parameters analyzed fall into several categories: physical parameters and general chemistry, bacterial parameters, metals, and organic substances including volatile and chloroaromatic substances and pesticides.

The discussion of results focuses on health-related parameters found in treated water:

(a) **Organic Substances**

Analysis was carried out for approximately 110 organic compounds. The only volatile compounds found, trihalomethanes (THMs) were always present in treated waters; the highest level recorded for total THMs was 43 ug/L.

None of the pesticides analyzed for was found.

No chlorophenolic compounds were found.

Only one other organic compound was found at quantifiable levels in treated water at this supply; this was 1,2,4,5-tetrachlorobenzene (17 ng/L).

(b) **Other Parameters**

The aesthetic ODWO* for organic nitrogen was exceeded in one treated water sample. Of the other physical, general chemistry and microbiological parameters and metals analyzed, for which there are health-related ODWO, none exceeded the objectives, in treated water.

The results of these analyses are consistent with those obtained in other areas of the Great Lakes.

The treated water from the supply did not exceed any known health-related guidelines for organic substances applicable to drinking water.

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* The Ontario Drinking Water Objectives, revised 1983.

LAKE HURON WATER SUPPLY SYSTEM

SUMMARY TABLE OF RESULTS
DRINKING WATER SURVEILLANCE PROGRAM, 1986

Lake Huron Water Supply System was sampled 7 times in 1986.

PARAMETER CATEGORY	TYPE OF SAMPLE RAW	TREATED*
1. GENERAL CHEMISTRY - includes anions such as sulphate, field analyses such as chlorine residual and physical parameters such as colour.		
Total number of parameters in category: 21		
- Total number of analyses completed	126	126
- Total number of positive results	110	90
- **Number of times guidelines exceeded**	**N/A**	**1**
Guidelines exceeded - aesthetic ODWO** for organic nitrogen (1)		
2. METALS - includes metals such as copper and lead.		
Total number of parameters in category: 24		
- Total number of analyses completed	152	152
- Total number of positive results	66	66
- **Number of times guidelines exceeded**	**N/A**	**0**
3. BACTERIOLOGY - includes bacteria such as coliforms.		
Total number of parameters in category: 5		
- Total number of analyses completed	27	28
- Total number of positive results	19	4
- **Number of times guidelines exceeded**	**N/A**	**0**
4. VOLATILES - includes compounds such as benzene and toluene; also included in this category are trihalomethanes (5 parameters), acknowledged to be produced during water treatment.		
Total number of parameters in category: 29		
- Total number of analyses completed	197	196
- Total number of positive results	7	28
- **Number of times guidelines exceeded**	**N/A**	**0**
5. PESTICIDES -		
Total number of parameters in category: 65		
- Total number of analyses completed	277	277
- Total number of positive results	0	0
- **Number of times guidelines exceeded**	**N/A**	**0**
6. CHLOROAROMATICS AND CHLOROPHENOLS - includes a range of chlorinated organic compounds.		
Total number of parameters in category: 19		
- Total number of analyses completed	103	103
- Total number of positive results	0	1
- **Number of times guidelines exceeded**	**N/A**	**0**

* Total number of analyses completed will not always equal the number of parameters analyzed for multiplied by number of times the supply was sampled, because of accidents during shipping or analyses or analytical difficulties.

** Ontario Drinking Water Objective.

SOUTH PEEL (LAKEVIEW) WATER TREATMENT PLANT

DRINKING WATER SURVEILLANCE PROGRAM

ANNUAL REPORT - 1986

SOUTH PEEL (LAKEVIEW) WATER TREATMENT PLANT

Location:	920 East Avenue Mississauga, Ontario L5E 1W6 (416-278-8471)
Source:	Lake Ontario
Design Capacity:	218.0 1000 M3/day
Operation:	Ministry of the Environment
Plant Superintendent:	R. Tufts
System Manager:	J. Timko
Ministry Region:	Central Region Toronto Regional Office 7 Overlea Blvd. Toronto, Ont. M4H 1A8 (416-424-3000)
Municipalities Served:	Brampton (125,000) Mississauga (325,000)
Treatment Type:	Physical and chemical treatment consisting of coagulation, flocculation, sedimentation and filtration, (conventional) and disinfection as well as taste and odour control and fluoridation.
Chemicals Used:	Prechlorination - chlorine Coagulation - alum liquid Dechlorination - sulphur dioxide Post chlorination - chlorine Fluoridation - hydrofluosilicic acid Taste and odour control - aqua ammonia.

SOUTH PEEL (LAKEVIEW) WATER TREATMENT PLANT

EXECUTIVE SUMMARY
DRINKING WATER SURVEILLANCE PROGRAM, 1986

The South Peel (Lakeview) Water Treatment Plant was sampled 13 times in 1986; results are given for raw and treated samples.

The parameters analyzed fall into several categories: physical parameters and general chemistry, bacterial parameters, metals, and organic substances including volatile and chloroaromatic substances and pesticides.

The discussion of results focuses on health-related parameters found in treated water:

(a) **Organic Substances**

Analysis was carried out for approximately 110 organic compounds. The only volatile compounds found, trihalomethanes (THMs) were always present in treated waters; the highest level recorded for total THMs was 50 ug/L.

None of the pesticides analyzed for was found.

No chlorophenolic or chloroaromatic compounds were found.

(b) **Other Parameters**

The aesthetic ODWO* for organic nitrogen was exceeded in most treated water samples; while the ODWO for turbidity was exceeded in one sample of treated water. Of the other physical, general chemistry and microbiological parameters and metals analyzed, for which there are health-related ODWO, none exceeded the objectives, in treated water.

The results of these analyses are consistent with those obtained in other areas of the Great Lakes.

The treated water from the supply did not exceed any known health-related guidelines for organic substances applicable to drinking water.

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* The Ontario Drinking Water Objectives, revised 1983.

SOUTH PEEL (LAKEVIEW) WATER TREATMENT PLANT

SUMMARY TABLE OF RESULTS
DRINKING WATER SURVEILLANCE PROGRAM, 1986

The South Peel (Lakeview) Water Treatment Plant was sampled 13 times in 1986.

PARAMETER CATEGORY	TYPE OF SAMPLE RAW	TREATED*
1. GENERAL CHEMISTRY - includes anions such as sulphate, field analyses such as chlorine residual and physical parameters such as colour.		
Total number of parameters in category: 21		
- Total number of analyses completed	234	232
- Total number of positive results	227	179
- **Number of times guidelines exceeded**	**N/A**	**10**
Guidelines exceeded - aesthetic ODWO** for organic nitrogen (9) - ODWO for turbidity (1)		
2. METALS - includes metals such as copper and lead.		
Total number of parameters in category: 24		
- Total number of analyses completed	280	280
- Total number of positive results	166	148
- **Number of times guidelines exceeded**	**N/A**	**0**
3. BACTERIOLOGY - includes bacteria such as coliforms.		
Total number of parameters in category: 5		
- Total number of analyses completed	52	61
- Total number of positive results	51	13
- **Number of times guidelines exceeded**	**N/A**	**0**
4. VOLATILES - includes compounds such as benzene and toluene; also included in this category are trihalomethanes (5 parameters), acknowledged to be produced during water treatment.		
Total number of parameters in category: 29		
- Total number of analyses completed	335	363
- Total number of positive results	0	51
- **Number of times guidelines exceeded**	**N/A**	**0**
5. PESTICIDES -		
Total number of parameters possible in category: 65		
- Total number of analyses completed	407	440
- Total number of positive results	0	0
- **Number of times guidelines exceeded**	**N/A**	**0**
6. CHLOROAROMATICS AND CHLOROPHENOLS - includes a range of chlorinated organic compounds.		
Total number of parameters possible in category: 19		
- Total number of analyses completed	168	181
- Total number of positive results	0	0
- **Number of times guidelines exceeded**	**N/A**	**0**

* Total number of analyses completed will not always equal the number of parameters analyzed for multiplied by number of times the supply was sampled, because of accidents during shipping or analyses or analytical difficulties.

** Ontario Drinking Water Objective.

LAMBTON AREA WATER SUPPLY

(SARNIA)

DRINKING WATER SURVEILLANCE

PROGRAM

ANNUAL REPORT - 1986

LAMBTON AREA WATER SUPPLY (Sarnia)

Location:	1215 Fort Street, P.O. Box 790 Sarnia, Ontario (519-344-7429)
Source:	Lake Huron/St. Clair River
Design Capacity:	181.8 1000 M3/day
Operation:	Ministry of the Environment
Plant Superintendent:	J. Horsburgh
Ministry Region:	Southwestern Region London Regional Office 985 Adelaide Street South London, Ontario N6E 1V3 (519-661-2200)
Municipalities Served:	Point Edward Village (2,373) Sarnia City (50,233) Sarnia Township (20,913) Moore Township (10,097) Sombra Township (4,249)
Treatment Type:	Physical and chemical treatment consisting of coagulation, flocculation and direct filtration with disinfection and fluoridation.
Chemicals Used:	Prechlorination - chlorine Coagulation - alum liquid with polyelectrolyte as needed Post chlorination - chlorine Fluoridation - hydrofluosilicic acid

LAMBTON AREA WATER SUPPLY
(SARNIA)

EXECUTIVE SUMMARY
DRINKING WATER SURVEILLANCE PROGRAM, 1986

The Lambton Area Water Supply (Sarnia) was sampled 9 times after April 30, 1986; results are given for raw and treated samples.

The parameters analyzed fall into several categories: physical parameters and general chemistry, bacterial parameters, metals, and organic substances including volatile and chloroaromatic substances and pesticides.

The discussion of results focuses on health-related parameters found in treated water:

(a) **Organic Substances**

Analysis was carried out for approximately 110 organic compounds. The only volatile compounds found, trihalomethanes (THMs) were always present in treated waters; the highest level recorded for total THMs was 56 ug/L.

None of the pesticides analyzed for was found.

No chlorophenolic or chloroaromatic compounds were found.

(b) **Other Parameters**

The aesthetic ODWO* for organic nitrogen was exceeded in one treated water sample. Of the other physical, general chemistry and microbiological parameters and metals analyzed, for which there are health-related ODWO, none exceeded the objectives, in treated water.

The results of these analyses are consistent with those obtained in other areas of the Great Lakes.

The treated water from the supply did not exceed any known health-related guidelines for organic substances applicable to drinking water.

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* The Ontario Drinking Water Objectives, revised 1983.

LAMBTON AREA WATER SUPPLY
(SARNIA)

SUMMARY TABLE OF RESULTS
DRINKING WATER SURVEILLANCE PROGRAM, 1986

The Lambton Area Water Supply (Sarnia) was sampled 9 times after April 30, 1986

PARAMETER CATEGORY	TYPE OF SAMPLE RAW	TREATED*
1. GENERAL CHEMISTRY - includes anions such as sulphate, field analyses such as chlorine residual and physical parameters such as colour.		
Total number of parameters in category: 21		
- Total number of analyses completed	162	144
- Total number of positive results	129	103
- **Number of times guidelines exceeded**	**N/A**	**1**
Guidelines exceeded - aesthetic ODWO** for organic nitrogen (1)		
2. METALS - includes metals such as copper and lead.		
Total number of parameters in category: 24		
- Total number of analyses completed	194	173
- Total number of positive results	90	75
- **Number of times guidelines exceeded**	**N/A**	**0**
3. BACTERIOLOGY - includes bacteria such as coliforms.		
Total number of parameters in category: 5		
- Total number of analyses completed	35	31
- Total number of positive results	20	3
- **Number of times guidelines exceeded**	**N/A**	**0**
4. VOLATILES - includes compounds such as benzene and toluene; also included in this category are trihalomethanes (5 parameters), acknowledged to be produced during water treatment.		
Total number of parameters in category: 29		
- Total number of analyses completed	251	223
- Total number of positive results	8	32
- **Number of times guidelines exceeded**	**N/A**	**0**
5. PESTICIDES -		
Total number of parameters possible in category: 65		
- Total number of analyses completed	307	275
- Total number of positive results	0	0
- **Number of times guidelines exceeded**	**N/A**	**0**
6. CHLOROAROMATICS AND CHLOROPHENOLS - includes a range of chlorinated organic compounds.		
Total number of parameters possible in category: 19		
- Total number of analyses completed	129	116
- Total number of positive results	0	0
- **Number of times guidelines exceeded**	**N/A**	**0**

* Total number of analyses completed will not always equal the number of parameters analyzed for multiplied by number of times the supply was sampled, because of accidents during shipping or analyses or analytical difficulties.

** Ontario Drinking Water Objective.

LEMIEUX ISLAND WATER TREATMENT PLANT

OTTAWA

DRINKING WATER SURVEILLANCE PROGRAM

ANNUAL REPORT - 1986

LEMIEUX ISLAND WATER TREATMENT PLANT
OTTAWA

Location:	Bayview Road, Lemieux Island Ottawa, Ontario (613-728-3771)
Source:	Ottawa River
Design Capacity:	298.7 1000 M3/day
Operation:	Municipal
Plant Superintendent:	L. Scharfe
Ministry Region:	Southeastern Region Ottawa District Office 2378 Holly Lane Ottawa, Ontario K1V 7P1 (613-521-3450)
Municipalities Served:	Ottawa (304,000) Gloucester (76,589) Vanier (18,877) Rockcliffe (2,267) Goulbourn (9,720) Cumberland (17,008) Osgoode (9,561)
Treatment Type:	Physical and chemical treatment consisting of coagulation, flocculation, sedimentation and filtration (conventional) and disinfection as well as post pH adjustment and fluoridation.
Chemicals Used:	Prechlorination - chlorine Coagulation - alum liquid with activated silica (sodium silicate activated with alum) Post chlorination - chlorine Post pH adjustment - calcium carbonate Fluoridation - hydrofluosilicic acid

LEMIEUX ISLAND WATER TREATMENT PLANT
OTTAWA

EXECUTIVE SUMMARY
DRINKING WATER SURVEILLANCE PROGRAM, 1986

The Lemieux Island Water Treatment Plant, Ottawa was sampled 4 times in 1986; results are given for raw and treated samples.

The parameters analyzed fall into several categories: physical parameters and general chemistry, bacterial parameters, metals, and organic substances including volatile and chloroaromatic substances and pesticides.

The discussion of results focuses on health-related parameters found in treated water:

(a) **Organic Substances**

Analysis was carried out for approximately 110 organic compounds. The only volatile compounds found, trihalomethanes (THMs) were always present in treated waters; the highest level recorded for total THMs was 192 ug/L.

None of the pesticides analyzed for was found.

No chlorophenolic compounds were found.

Only two other organic compounds were found at quantifiable levels in treated water at this supply; hexachloroethane was found at 10 ng/L on only one occasion, as was 1,2,4,5-tetrachlorobenzene, at 10 ng/L.

(b) **Other Parameters**

The aesthetic ODWO* for colour was exceeded in one treated water sample, and the ODWO for turbidity was exceeded on two occasions. Of the other physical, general chemistry and microbiological parameters and metals analyzed, for which there are health-related ODWO, none exceeded the objectives, in treated water.

The results of these analyses are consistent with those obtained in other areas of the Great Lakes.

The treated water from the supply did not exceed any known health-related guidelines for organic substances applicable to drinking water.

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* The Ontario Drinking Water Objectives, revised 1983.

LEMIEUX ISLAND WATER TREATMENT PLANT
OTTAWA

SUMMARY TABLE OF RESULTS
DRINKING WATER SURVEILLANCE PROGRAM, 1986

The Lemieux Island Water Treatment Plant, Ottawa was sampled 4 times in 1986.

PARAMETER CATEGORY	TYPE OF SAMPLE RAW	TREATED*
1. GENERAL CHEMISTRY - includes anions such as sulphate, field analyses such as chlorine residual and physical parameters such as colour.		
Total number of parameters in category: 21		
- Total number of analyses completed	72	72
- Total number of positive results	62	58
- **Number of times guidelines exceeded**	**N/A**	**3**
Guidelines exceeded - aesthetic ODWO** for colour (1)		
- ODWO for turbidity (2)		
2. METALS - includes metals such as copper and lead.		
Total number of parameters in category: 24		
- Total number of analyses completed	88	88
- Total number of positive results	42	35
- **Number of times guidelines exceeded**	**N/A**	**0**
3. BACTERIOLOGY - includes bacteria such as coliforms.		
Total number of parameters in category: 5		
- Total number of analyses completed	16	16
- Total number of positive results	15	3
- **Number of times guidelines exceeded**	**N/A**	**0**
4. VOLATILES - includes compounds such as benzene and toluene; also included in this category are trihalomethanes (5 parameters), acknowledged to be produced during water treatment.		
Total number of parameters in category: 29		
- Total number of analyses completed	114	114
- Total number of positive results	0	12
- **Number of times guidelines exceeded**	**N/A**	**0**
5. PESTICIDES -		
Total number of parameters possible in category: 65		
- Total number of analyses completed	169	169
- Total number of positive results	0	0
- **Number of times guidelines exceeded**	**N/A**	**0**
6. CHLOROAROMATICS AND CHLOROPHENOLS - includes a range of chlorinated organic compounds.		
Total number of parameters possible in category: 19		
- Total number of analyses completed	58	58
- Total number of positive results	0	2
- **Number of times guidelines exceeded**	**N/A**	**0**

* Total number of analyses completed will not always equal the number of parameters analyzed for multiplied by number of times the supply was sampled, because of accidents during shipping or analyses or analytical difficulties.

** Ontario Drinking Water Objective.

LORNE PARK WATER TREATMENT PLANT

MISSISSAUGA

DRINKING WATER SURVEILLANCE PROGRAM

ANNUAL REPORT - 1986

LORNE PARK WATER TREATMENT PLANT
MISSISSAUGA

Location:	1180 Lakeshore Road West Mississauga, Ontario (416-822-9120)
Source:	Lake Ontario
Design Capacity:	227.3 1000 M3/day
Operation:	Ministry of the Environment
Plant Superintendent:	R. Tufts
System Manager:	J. Timko
Ministry Region:	Central Region Toronto Regional Office 7 Overlead Blvd Toronto, Ontario M4H 1A8 (416-424-3000)
Municipalities Served:	Brampton (125,000) Mississauga (325,000)
Treatment Type:	Physical and chemical treatment consisting of coagulation, flocculation, and direct filtration and disinfection as well as fluoridation.
Chemicals:	Prechlorination - sodium hypochlorite Coagulation - alum liquid Post chlorination - chlorination with sodium hypochlorite Fluoridation - hydrofluosilicic acid

LORNE PARK WATER TREATMENT PLANT
MISSISSAUGA

EXECUTIVE SUMMARY
DRINKING WATER SURVEILLANCE PROGRAM, 1986

The Lorne Park Water Treatment Plant, Mississauga was sampled 4 times in 1986; results are given for raw and treated samples.

The parameters analyzed fall into several categories: physical parameters and general chemistry, bacterial parameters, metals, and organic substances including volatile and chloroaromatic substances and pesticides.

The discussion of results focuses on health-related parameters found in treated water:

(a) **Organic Substances**

Analysis was carried out for approximately 110 organic compounds. The only volatile compounds found, trihalomethanes (THMs) were always present in treated waters; the highest level recorded for total THMs was 72 ug/L.

None of the pesticides analyzed for was found.

No chlorophenolic compounds were analyzed for. No chloroaromatic compounds were found.

(b) **Other Parameters**

Of the physical, general chemistry and microbiological parameters and metals analyzed, for which there are health-related ODWO*, none exceeded the objectives, in treated water.

The results of these analyses are consistent with those obtained in other areas of the Great Lakes.

The treated water from the supply did not exceed any known health-related guidelines for organic substances applicable to drinking water.

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* The Ontario Drinking Water Objectives, revised 1983.

LORNE PARK WATER TREATMENT PLANT
MISSISSAUGA

SUMMARY TABLE OF RESULTS
DRINKING WATER SURVEILLANCE PROGRAM, 1986

The Lorne Park Water Treatment Plant, Mississauga was sampled 4 times in 1986.

PARAMETER CATEGORY	TYPE OF SAMPLE RAW	TREATED*
1. GENERAL CHEMISTRY - includes anions such as sulphate, field analyses such as chlorine residual and physical parameters such as colour.		
Total number of parameters in category: **21**		
- Total number of analyses completed	72	72
- Total number of positive results	69	55
- **Number of times guidelines exceeded**	**N/A**	**0**
2. METALS - includes metals such as copper and lead.		
Total number of parameters in category: **24**		
- Total number of analyses completed	84	84
- Total number of positive results	44	40
- **Number of times guidelines exceeded**	**N/A**	**0**
3. BACTERIOLOGY - includes bacteria such as coliforms.		
Total number of parameters in category: **5**		
- Total number of analyses completed	16	16
- Total number of positive results	16	2
- **Number of times guidelines exceeded**	**N/A**	**0**
4. VOLATILES - includes compounds such as benzene and toluene; also included in this category are trihalomethanes (5 parameters), acknowledged to be produced during water treatment.		
Total number of parameters in category: **29**		
- Total number of analyses completed	111	110
- Total number of positive results	0	16
- **Number of times guidelines exceeded**	**N/A**	**0**
5. PESTICIDES -		
Total number of parameters possible in category: **65**		
- Total number of analyses completed	74	74
- Total number of positive results	0	0
- **Number of times guidelines exceeded**	**N/A**	**0**
6. CHLOROAROMATICS AND CHLOROPHENOLS - includes a range of chlorinated organic compounds.		
Total number of parameters possible in category: **19**		
- Total number of analyses completed	39	39
- Total number of positive results	0	0
- **Number of times guidelines exceeded**	**N/A**	**0**

* Total number of analyses completed will not always equal the number of parameters analyzed for multiplied by number of times the supply was sampled, because of accidents during shipping or analyses or analytical difficulties.

** Ontario Drinking Water Objective.

MITCHELL'S BAY WATER TREATMENT PLANT

DRINKING WATER SURVEILLANCE PROGRAM

ANNUAL REPORT - 1986

MITCHELL'S BAY WATER TREATMENT PLANT

Location:	Mitchells Bay Mitchell's Bay, Ontario (519-351-3838)
Source:	Lake St. Clair via dredged channel under lake
Design Capacity:	1.091 1000 M3/day
Operation:	Ministry of the Environment
Plant Superintendent:	W. Campbell
Ministry Region:	Southwestern Region Windsor District Office 250 Windsor Avenue, 6th Floor Windsor, Ontario L8N 3Z9 (519-254-2546)
Municipalities Served:	Mitchell's Bay (350)
Treatment Type:	Physical and chemical treatment consisting of coagulation, flocculation, sedimentation and filtration, (package plant) and disinfection as well as activated carbon adsorption.
Chemicals Used:	Adsorption - powdered activated carbon Coagulation - alum liquid with polyelectrolyte Post chlorination - chlorine

MITCHELL'S BAY WATER TREATMENT PLANT

EXECUTIVE SUMMARY
DRINKING WATER SURVEILLANCE PROGRAM, 1986

The Mitchell's Bay Water Treatment Plant was sampled 3 times after April 30, 1986; results are given for raw and treated samples.

The parameters analyzed fall into several categories: physical parameters and general chemistry, bacterial parameters, metals, and organic substances including volatile and chloroaromatic substances and pesticides.

The discussion of results focuses on health-related parameters found in treated water:

(a) **Organic Substances**

Analysis was carried out for approximately 110 organic compounds. The only volatile compounds found, trihalomethanes (THMs) were always present in treated waters; the highest level recorded for total THMs was 54 ug/L.

None of the pesticides analyzed for was found.

No chlorophenolic compounds were analyzed for. No chloroaromatic compounds were found.

(b) **Other Parameters**

The aesthetic ODWO* for organic nitrogen was exceeded in one treated water sample. Of the other physical, general chemistry and microbiological parameters and metals analyzed, for which there are health-related ODWO, none exceeded the objectives, in treated water.

The results of these analyses are consistent with those obtained in other areas of the Great Lakes.

The treated water from the supply did not exceed any known health-related guidelines for organic substances applicable to drinking water.

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* The Ontario Drinking Water Objectives, revised 1983.

MITCHELL'S BAY WATER TREATMENT PLANT

SUMMARY TABLE OF RESULTS
DRINKING WATER SURVEILLANCE PROGRAM, 1986

The Mitchell's Bay Water Treatment Plant was sampled 3 times after April 30, 1986.

PARAMETER CATEGORY	TYPE OF SAMPLE RAW	TREATED*
1. GENERAL CHEMISTRY - includes anions such as sulphate, field analyses such as chlorine residual and physical parameters such as colour.		
Total number of parameters in category: 21		
- Total number of analyses completed	54	54
- Total number of positive results	52	41
- **Number of times guidelines exceeded**	**N/A**	**1**
Guidelines exceeded - aesthetic ODWO** for organic nitrogen (1)		
2. METALS - includes metals such as copper and lead.		
Total number of parameters in category: 24		
- Total number of analyses completed	64	62
- Total number of positive results	32	28
- **Number of times guidelines exceeded**	**N/A**	**0**
3. BACTERIOLOGY - includes bacteria such as coliforms.		
Total number of parameters in category: 5		
- Total number of analyses completed	12	10
- Total number of positive results	11	3
- **Number of times guidelines exceeded**	**N/A**	**0**
4. VOLATILES - includes compounds such as benzene and toluene; also included in this category are trihalomethanes (5 parameters), acknowledged to be produced during water treatment.		
Total number of parameters in category: 29		
- Total number of analyses completed	85	85
- Total number of positive results	0	12
- **Number of times guidelines exceeded**	**N/A**	**0**
5. PESTICIDES -		
Total number of parameters possible in category: 65		
- Total number of analyses completed	98	98
- Total number of positive results	0	0
- **Number of times guidelines exceeded**	**N/A**	**0**
6. CHLOROAROMATICS AND CHLOROPHENOLS - includes a range of chlorinated organic compounds.		
Total number of parameters possible in category: 19		
- Total number of analyses completed	39	39
- Total number of positive results	0	0
- **Number of times guidelines exceeded**	**N/A**	**0**

* Total number of analyses completed will not always equal the number of parameters analyzed for multiplied by number of times the supply was sampled, because of accidents during shipping or analyses or analytical difficulties.

** Ontario Drinking Water Objective.

NIAGARA FALLS WATER TREATMENT PLANT

DRINKING WATER SURVEILLANCE PROGRAM

ANNUAL REPORT - 1986

NIAGARA FALLS WATER TREATMENT PLANT

Location:	3599 Macklem Street Niagara Falls, Ontario L2G 6C7 (416-295-4831)
Source:	Niagara River via the Welland River Channel
Design Capacity:	145.5 1000 M3/day
Operation:	Municipal
Plant Superintendent:	H. Hodgson
Ministry Region:	West Central Region Welland District Office 637-641 Niagara Street North Welland, Ontario L3C 1L9 (416-384-9896)
Municipalities Served:	City of Niagara Falls (Chippawa) (68,425) Part of Town of Niagara-on-the-Lake (275)
Treatment Type:	Physical and chemical treatment consisting of screening, coagulation, flocculation, sedimentation and filtration, (conventional) and disinfection as well as taste and odour control when required.
Chemicals Used:	Prechlorination - chlorine Coagulation - alum liquid Post chlorination - chlorine Taste & odour control - powdered activated carbon

NIAGARA FALLS WATER TREATMENT PLANT

EXECUTIVE SUMMARY
DRINKING WATER SURVEILLANCE PROGRAM, 1986

The Niagara Falls Water Treatment Plant was sampled 15 times in 1986; results are given for raw and treated samples.

The parameters analyzed fall into several categories: physical parameters and general chemistry, bacterial parameters, metals, and organic substances including volatile and chloroaromatic substances and pesticides.

The discussion of results focuses on health-related parameters found in treated water:

(a) **Organic Substances**

Analysis was carried out for approximately 110 organic compounds. The only volatile compounds found, trihalomethanes (THMs) were always present in treated waters; the highest level recorded for total THMs was 48 ug/L.

None of the pesticides analyzed for was found in treated water.

No chlorophenolic or chloroaromatic compounds were found.

(b) **Other Parameters**

The aesthetic ODWO* for organic nitrogen was exceeded in eight treated water samples. Of the other physical, general chemistry and microbiological parameters and metals analyzed, for which there are health-related ODWO, none exceeded the objectives, in treated water.

The results of these analyses are consistent with those obtained in other areas of the Great Lakes.

The treated water from the supply did not exceed any known health-related guidelines for organic substances applicable to drinking water.

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* The Ontario Drinking Water Objectives, revised 1983.

NIAGARA FALLS WATER TREATMENT PLANT

SUMMARY TABLE OF RESULTS
DRINKING WATER SURVEILLANCE PROGRAM, 1986

The Niagara Falls Water Treatment Plant was sampled 15 times in 1986.

PARAMETER CATEGORY	TYPE OF SAMPLE RAW	TREATED*
1. GENERAL CHEMISTRY - includes anions such as sulphate, field analyses such as chlorine residual and physical parameters such as colour.		
Total number of parameters in category: 21		
- Total number of analyses completed	261	270
- Total number of positive results	229	190
- **Number of times guidelines exceeded**	**N/A**	**8**
Guidelines exceeded - aesthetic ODWO** for organic nitrogen (8)		
2. METALS - includes metals such as copper and lead.		
Total number of parameters in category: 24		
- Total number of analyses completed	321	321
- Total number of positive results	162	150
- **Number of times guidelines exceeded**	**N/A**	**0**
3. BACTERIOLOGY - includes bacteria such as coliforms.		
Total number of parameters in category: 5		
- Total number of analyses completed	58	60
- Total number of positive results	56	17
- **Number of times guidelines exceeded**	**N/A**	**0**
4. VOLATILES - includes compounds such as benzene and toluene; also included in this category are trihalomethanes (5 parameters), acknowledged to be produced during water treatment.		
Total number of parameters in category: 29		
- Total number of analyses completed	419	418
- Total number of positive results	0	60
- **Number of times guidelines exceeded**	**N/A**	**0**
5. PESTICIDES -		
Total number of parameters possible in category: 65		
- Total number of analyses completed	516	516
- Total number of positive results	1	0
- **Number of times guidelines exceeded**	**N/A**	**0**
6. CHLOROAROMATICS AND CHLOROPHENOLS - includes a range of chlorinated organic compounds.		
Total number of parameters possible in category: 19		
- Total number of analyses completed	213	212
- Total number of positive results	0	0
- **Number of times guidelines exceeded**	**N/A**	**0**

* Total number of analyses completed will not always equal the number of parameters analyzed for multiplied by number of times the supply was sampled, because of accidents during shipping or analyses or analytical difficulties.

** Ontario Drinking Water Objective.

PORT STANLEY WATER TREATMENT PLANT

DRINKING WATER SURVEILLANCE PROGRAM

ANNUAL REPORT - 1986

PORT STANLEY WATER TREATMENT PLANT

Location:	430 Edith Cavell Blvd. Port Stanley, Ontario (519-782-3251)
Source:	Lake Erie
Design Capacity:	3.273 1000 M3/day
Operation:	Municipal
Plant Superintendent:	John L. Bolt
Ministry Region:	Southwestern Region London Regional Office 985 Adelaide Street South London, Ontario (519-661-2200)
Municipalities Served:	Port Stanley (2,000) Yarmouth Township (54) Southwould (36)
Treatment Type:	Physical and chemical treatment consisting of coagulation, flocculation with pressure filtration and disinfection with fluoridation.
Chemicals Used:	Prechlorination - chlorine Coagulation - powdered alum Fluoridation - sodium fluoride

PORT STANLEY WATER TREATMENT PLANT

EXECUTIVE SUMMARY
DRINKING WATER SURVEILLANCE PROGRAM, 1986

The Port Stanley Water Treatment Plant was sampled 6 times in 1986; results are given for raw and treated samples.

The parameters analyzed fall into several categories: physical parameters and general chemistry, bacterial parameters, metals, and organic substances including volatile and chloroaromatic substances and pesticides.

The discussion of results focuses on health-related parameters found in treated water:

(a) **Organic Substances**

Analysis was carried out for approximately 110 organic compounds. The only volatile compounds found, trihalomethanes (THMs) were always present in treated waters; the highest level recorded for total THMs was 85 ug/L.

None of the pesticides analyzed for was found.

No chlorophenolic compounds were analyzed for.

Only two other organic compounds were found at quantifiable levels in treated water at this supply; 1,2,3,5-tetrachlorobenzene was found at 16 ng/L and 2,3,6-trichlorotoluene at 68 ng/L.

(b) **Other Parameters**

The aesthetic ODWO* for organic nitrogen was exceeded in two treated water samples and the ODWO for turbidity on one occasion. Of the other physical, general chemistry and microbiological parameters and metals analyzed, for which there are health-related ODWO, none exceeded the objectives, in treated water.

The results of these analyses are consistent with those obtained in other areas of the Great Lakes.

The treated water from the supply did not exceed any known health-related guidelines for organic substances applicable to drinking water.

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* The Ontario Drinking Water Objectives, revised 1983.

PORT STANLEY WATER TREATMENT PLANT

SUMMARY TABLE OF RESULTS
DRINKING WATER SURVEILLANCE PROGRAM, 1986

The Port Stanley Water Treatment Plant was sampled 6 times in 1986.

PARAMETER CATEGORY	TYPE OF SAMPLE RAW	TREATED*
1. GENERAL CHEMISTRY - includes anions such as sulphate, field analyses such as chlorine residual and physical parameters such as colour.		
Total number of parameters in category: 21		
- Total number of analyses completed	108	108
- Total number of positive results	102	81
- **Number of times guidelines exceeded**	**N/A**	**3**
Guidelines exceeded - aesthetic ODWO** for organic nitrogen (2) - ODWO for turbidity (1)		
2. METALS - includes metals such as copper and lead.		
Total number of parameters in category: 24		
- Total number of analyses completed	127	127
- Total number of positive results	68	68
- **Number of times guidelines exceeded**	**N/A**	**0**
3. BACTERIOLOGY - includes bacteria such as coliforms.		
Total number of parameters in category: 5		
- Total number of analyses completed	22	28
- Total number of positive results	22	5
- **Number of times guidelines exceeded**	**N/A**	**0**
4. VOLATILES - includes compounds such as benzene and toluene; also included in this category are trihalomethanes (5 parameters), acknowledged to be produced during water treatment.		
Total number of parameters in category: 29		
- Total number of analyses completed	167	168
- Total number of positive results	0	24
- **Number of times guidelines exceeded**	**N/A**	**0**
5. PESTICIDES -		
Total number of parameters possible in category: 65		
- Total number of analyses completed	155	155
- Total number of positive results	0	0
- **Number of times guidelines exceeded**	**N/A**	**0**
6. CHLOROAROMATICS AND CHLOROPHENOLS - includes a range of chlorinated organic compounds.		
Total number of parameters possible in category: 19		
- Total number of analyses completed	78	78
- Total number of positive results	0	2
- **Number of times guidelines exceeded**	**N/A**	**0**

* Total number of analyses completed will not always equal the number of parameters analyzed for multiplied by number of times the supply was sampled, because of accidents during shipping or analyses or analytical difficulties.

** Ontario Drinking Water Objective.

STONEY POINT WATER TREATMENT PLANT

DRINKING WATER SURVEILLANCE PROGRAM

ANNUAL REPORT - 1986

STONEY POINT WATER TREATMENT PLANT

Location:	6011 St. Clair Road West P.O. Box 70 Stoney Point, Ontario N0R 1N0 (519-798-3313)
Source:	Lake St. Clair
Design Capacity:	4.45 1000 M3/day
Operation:	Municipal
Plant Superintendent:	G. Scroggins
Ministry Region:	Southwestern Region Windsor District Office 250 Windsor Avenue, 6th Floor Windsor, Ontario N9A 6V9 (519-254-2546)
Municipalities Served:	Tilbury North (3,155) Tilbury West (326)
Treatment Type:	Physical and chemical treatment consisting of coagulation, flocculation sedimentation and filtration (conventional) and disinfection.
Chemicals Used:	Coagulation - alum liquid Post chlorination - chlorine

STONEY POINT WATER TREATMENT PLANT

EXECUTIVE SUMMARY
DRINKING WATER SURVEILLANCE PROGRAM, 1986

The Stoney Point Water Treatment Plant was sampled 10 times in 1986; results are given for raw and treated samples.

The parameters analyzed fall into several categories: physical parameters and general chemistry, bacterial parameters, metals, and organic substances including volatile and chloroaromatic substances and pesticides.

The discussion of results focuses on health-related parameters found in treated water:

(a) **Organic Substances**

Analysis was carried out for approximately 110 organic compounds. The only volatile compounds found, trihalomethanes (THMs) were always present in treated waters; the highest level recorded for total THMs was 75 ug/L.

None of the pesticides analyzed for was found.

No chlorophenolic compounds were analyzed for.

Three chloroaromatic compounds were found in treated water. Hexachloroethane was found once at 12 ng/L as was 1,2,3,5-tetrachlorobenzene at 31 ng/L, while 2,3,6-trichlorotoluene was found twice at 50 ng/L and 26 ng/L.

(b) **Other Parameters**

The aesthetic ODWO* for organic nitrogen was exceeded in three treated water samples. Of the other physical, general chemistry and microbiological parameters and metals analyzed, for which there are health-related ODWO, none exceeded the objectives, in treated water.

The results of these analyses are consistent with those obtained in other areas of the Great Lakes.

The treated water from the supply did not exceed any known health-related guidelines for organic substances applicable to drinking water.

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* The Ontario Drinking Water Objectives, revised 1983.

STONEY POINT WATER TREATMENT PLANT

SUMMARY TABLE OF RESULTS
DRINKING WATER SURVEILLANCE PROGRAM, 1986

The Stoney Point Water Treatment Plant was sampled 10 times in 1986.

PARAMETER CATEGORY	TYPE OF SAMPLE RAW	TREATED*
1. GENERAL CHEMISTRY - includes anions such as sulphate, field analyses such as chlorine residual and physical parameters such as colour.		
Total number of parameters in category: 21		
- Total number of analyses completed	180	180
- Total number of positive results	178	133
- **Number of times guidelines exceeded**	**N/A**	**3**
Guidelines exceeded - aesthetic ODWO** for organic nitrogen (3)		
2. METALS - includes metals such as copper and lead.		
Total number of parameters in category: 24		
- Total number of analyses completed	191	210
- Total number of positive results	95	96
- **Number of times guidelines exceeded**	**N/A**	**0**
3. BACTERIOLOGY - includes bacteria such as coliforms.		
Total number of parameters in category: 5		
- Total number of analyses completed	34	39
- Total number of positive results	25	4
- **Number of times guidelines exceeded**	**N/A**	**0**
4. VOLATILES - includes compounds such as benzene and toluene; also included in this category are trihalomethanes (5 parameters), acknowledged to be produced during water treatment.		
Total number of parameters in category: 29		
- Total number of analyses completed	277	249
- Total number of positive results	0	36
- **Number of times guidelines exceeded**	**N/A**	**0**
5. PESTICIDES -		
Total number of parameters possible in category: 65		
- Total number of analyses completed	246	222
- Total number of positive results	0	0
- **Number of times guidelines exceeded**	**N/A**	**0**
6. CHLOROAROMATICS AND CHLOROPHENOLS - includes a range of chlorinated organic compounds.		
Total number of parameters possible in category: 19		
- Total number of analyses completed	130	114
- Total number of positive results	0	4
- **Number of times guidelines exceeded**	**N/A**	**0**

* Total number of analyses completed will not always equal the number of parameters analyzed for multiplied by number of times the supply was sampled, because of accidents during shipping or analyses or analytical difficulties.

** Ontario Drinking Water Objective.

WALLACEBURG WATER TREATMENT PLANT

DRINKING WATER SURVEILLANCE PROGRAM

ANNUAL REPORT - 1986

WALLACEBURG WATER TREATMENT PLANT

Location:	Libby Road Wallaceburg, Ontario (519-627-4191)
Source:	Chenal Ecarte
Design Capacity:	13.50 1000 M3/day
Operation:	Municipal
Plant Superintendent:	L. Denys
Ministry Region:	Southwestern Region Sarnia District Office Suite 109, 265 N. Front Street Sarnia, Ontario N7T 7X1 (519-681-3600)
Municipalities Served:	Wallaceburg (11,223)
Treatment Type:	Physical and chemical treatment consisting of coagulation, flocculation, sedimentation and filtration (conventional) and disinfection as well as fluoridation and activated carbon adsorption.
Chemicals Used:	Prechlorination - chlorine Adsorption - powdered activated carbon Coagulation - alum liquid Post chlorination - sulphur dioxide Fluoridation - hydrofluosilicic acid

WALLACEBURG WATER TREATMENT PLANT

EXECUTIVE SUMMARY
DRINKING WATER SURVEILLANCE PROGRAM, 1986

The Wallaceburg Water Treatment Plant was sampled 9 times after April 30, 1986; results are given for raw and treated samples.

The parameters analyzed fall into several categories: physical parameters and general chemistry, bacterial parameters, metals, and organic substances including volatile and chloroaromatic substances and pesticides.

The discussion of results focuses on health-related parameters found in treated water:

(a) **Organic Substances**

Analysis was carried out for approximately 110 organic compounds. Trihalomethanes (THMs) were always present in treated waters; the highest level recorded for total THMs was 50 ug/L.

None of the pesticides analyzed for was found.

No chlorophenolic or chloroaromatic compounds were found.

(b) **Other Parameters**

Of the physical, general chemistry and microbiological parameters and metals analyzed, for which there are health-related ODWO*, none exceeded the objectives, in treated water.

The results of these analyses are consistent with those obtained in other areas of the Great Lakes.

The treated water from the supply did not exceed any known health-related guidelines for organic substances applicable to drinking water.

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* The Ontario Drinking Water Objectives, revised 1983.

WALLACEBURG WATER TREATMENT PLANT

SUMMARY TABLE OF RESULTS
DRINKING WATER SURVEILLANCE PROGRAM, 1986

The Wallaceburg Water Treatment Plant was sampled 9 times after April 30, 1986.

PARAMETER CATEGORY	TYPE OF SAMPLE RAW	TREATED*
1. GENERAL CHEMISTRY - includes anions such as sulphate, field analyses such as chlorine residual and physical parameters such as colour.		
Total number of parameters in category: 21		
- Total number of analyses completed	162	161
- Total number of positive results	146	115
- **Number of times guidelines exceeded**	**N/A**	**0**
2. METALS - includes metals such as copper and lead.		
Total number of parameters in category: 24		
- Total number of analyses completed	195	195
- Total number of positive results	88	73
- **Number of times guidelines exceeded**	**N/A**	**0**
3. BACTERIOLOGY - includes bacteria such as coliforms.		
Total number of parameters in category: 5		
- Total number of analyses completed	35	32
- Total number of positive results	31	9
- **Number of times guidelines exceeded**	**N/A**	**0**
4. VOLATILES - includes compounds such as benzene and toluene; also included in this category are trihalomethanes (5 parameters), acknowledged to be produced during water treatment.		
Total number of parameters in category: 29		
- Total number of analyses completed	251	251
- Total number of positive results	1	37
- **Number of times guidelines exceeded**	**N/A**	**0**
5. PESTICIDES -		
Total number of parameters possible in category: 65		
- Total number of analyses completed	283	305
- Total number of positive results	0	0
- **Number of times guidelines exceeded**	**N/A**	**0**
6. CHLOROAROMATICS AND CHLOROPHENOLS - includes a range of chlorinated organic compounds.		
Total number of parameters possible in category: 19		
- Total number of analyses completed	110	123
- Total number of positive results	0	0
- **Number of times guidelines exceeded**	**N/A**	**0**

* Total number of analyses completed will not always equal the number of parameters analyzed for multiplied by number of times the supply was sampled, because of accidents during shipping or analyses or analytical difficulties.

** Ontario Drinking Water Objective.

WINDSOR UTILITIES COMMISSION

WATER TREATMENT PLANT

DRINKING WATER SURVEILLANCE PROGRAM

ANNUAL REPORT - 1986

WINDSOR UTILITIES COMMISSION WATER TREATMENT PLANT

Location:	3665 Wyandotte Street East Windsor, Ontario N8Y 1G4 (519-255-2786)
Source:	Detroit River
Design Capacity:	273 1000 M3/day
Operation:	Municipal
Plant Superintendent:	J.C. Fraser
Ministry Region:	Southwestern Region Windsor District Office 250 Windsor Avenue, 6th Floor Windsor, Ontario N9A 6V9 (519-254-2546)
Municipalities Served:	Sandwich South (3,748) Sandwich West (13,744) St. Clair Beach (3,026) Tecumseh (7,208) Windsor (195,028)
Treatment Type:	Physical and chemical treatment consisting of coagulation, sedimentation filtration (conventional) and disinfection as well as fluoridation.
Chemicals Used:	Prechlorination - chlorine Coagulation - alum liquid with polyelectrolyte Post chlorination - chlorine Fluoridation - hydrofluosilicic acid

WINDSOR UTILITIES COMMISSION
WATER TREATMENT PLANT

EXECUTIVE SUMMARY
DRINKING WATER SURVEILLANCE PROGRAM, 1986

The Windsor Utilities Commission, Water Treatment Plant was sampled 11 times in 1986; results are given for raw and treated samples.

The parameters analyzed fall into several categories: physical parameters and general chemistry, bacterial parameters, metals, and organic substances including volatile and chloroaromatic substances and pesticides.

The discussion of results focuses on health-related parameters found in treated water:

(a) **Organic Substances**

Analysis was carried out for approximately 110 organic compounds. The only volatile compounds found, trihalomethanes (THMs) were always present in treated waters; the highest level recorded for total THMs was 106 ug/L.

None of the pesticides analyzed for was found in treated water.

No chlorophenolic compounds were found.

Only two other organic compounds were found at quantifiable levels in treated water at this supply, both chloroaromatics; 1,2,4,5-tetrachlorobenzene was found at 11 ng/L and 2,3,6-trichlorotoluene at 91 ng/L.

(b) **Other Parameters**

The aesthetic ODWO* for organic nitrogen was exceeded in four treated water samples and the ODWO for turbidity also in four. Of the other physical, general chemistry and microbiological parameters and metals analyzed, for which there are health-related ODWO, none exceeded the objectives, in treated water.

The results of these analyses are consistent with those obtained in other areas of the Great Lakes.

The treated water from the supply did not exceed any known health-related guidelines for organic substances applicable to drinking water.

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* The Ontario Drinking Water Objectives, revised 1983.

WINDSOR UTILITIES COMMISSION
WATER TREATMENT PLANT

SUMMARY TABLE OF RESULTS
DRINKING WATER SURVEILLANCE PROGRAM, 1986

The Windsor Utilities Commission, Water Treatment Plant was sampled 11 times in 1986.

PARAMETER CATEGORY	TYPE OF SAMPLE RAW	TREATED*
1. GENERAL CHEMISTRY - includes anions such as sulphate, field analyses such as chlorine residual and physical parameters such as colour.		
Total number of parameters in category: 21		
- Total number of analyses completed	198	198
- Total number of positive results	180	144
- **Number of times guidelines exceeded**	**N/A**	**8**
Guidelines exceeded - aesthetic ODWO** for organic nitrogen (4) - ODWO for turbidity (4)		
2. METALS - includes metals such as copper and lead.		
Total number of parameters in category: 24		
- Total number of analyses completed	236	237
- Total number of positive results	123	108
- **Number of times guidelines exceeded**	**N/A**	**0**
3. BACTERIOLOGY - includes bacteria such as coliforms.		
Total number of parameters in category: 5		
- Total number of analyses completed	38	40
- Total number of positive results	30	5
- **Number of times guidelines exceeded**	**N/A**	**0**
4. VOLATILES - includes compounds such as benzene and toluene; also included in this category are trihalomethanes (5 parameters), acknowledged to be produced during water treatment.		
Total number of parameters in category: 29		
- Total number of analyses completed	309	310
- Total number of positive results	4	36
- **Number of times guidelines exceeded**	**N/A**	**0**
5. PESTICIDES -		
Total number of parameters possible in category: 65		
- Total number of analyses completed	412	388
- Total number of positive results	2	0
- **Number of times guidelines exceeded**	**N/A**	**0**
6. CHLOROAROMATICS AND CHLOROPHENOLS - includes a range of chlorinated organic compounds.		
Total number of parameters possible in category: 19		
- Total number of analyses completed	155	142
- Total number of positive results	0	2
- **Number of times guidelines exceeded**	**N/A**	**0**

* Total number of analyses completed will not always equal the number of parameters analyzed for multiplied by number of times the supply was sampled, because of accidents during shipping or analyses or analytical difficulties.

** Ontario Drinking Water Objective.

WALPOLE ISLAND WATER TREATMENT PLANT

DRINKING WATER SURVEILLANCE PROGRAM

ANNUAL REPORT - 1986

WALPOLE ISLAND WATER TREATMENT PLANT

Location:	R.R. #3 Wallaceburg Ontario N8A 4K9 (519-627-1426)
Source:	St. Clair River
Design Capacity:	2.511 1000 M3/day
Operation:	Federal Government
Plant Superintendent:	J. Tooshkenig
Ministry Region:	Southwestern Region Sarnia District Office Suite 109, 265 N Front Street Sarnia, Ontario N7T 7X1 (519-336-4030)
Municipalities Served:	Walpole Island (1,900) [Summer population - 21,000]
Treatment Type:	Physical and chemical treatment consisting of coagulation, flocculation sedimentation and filtration (conventional - package plant) and disinfection as well as activated carbon adsorption.
Chemicals Used:	Prechlorination - calcium hypochlorite Adsorption - powdered activated carbon Coagulation - alum liquid with polyelectrolyte Post chlorination - calcium hypochlorite

WALPOLE ISLAND WATER TREATMENT PLANT

EXECUTIVE SUMMARY
DRINKING WATER SURVEILLANCE PROGRAM, 1986

The Walpole Island Water Treatment Plant was sampled 4 times after April 30, 1986; results are given for raw and treated samples.

The parameters analyzed fall into several categories: physical parameters and general chemistry, bacterial parameters, metals, and organic substances including volatile and chloroaromatic substances and pesticides.

The discussion of results focuses on health-related parameters found in treated water:

(a) **Organic Substances**

Analysis was carried out for approximately 110 organic compounds. Trihalomethanes (THMs) were always present in treated waters; the highest level recorded for total THMs was 46 ug/L. Toluene was found in treated water at 2 ug/L on one occasion.

None of the pesticides analyzed for was found.

No chlorophenolic compounds were analyzed for. No chloroaromatic compounds were found.

(b) **Other Parameters**

Of the physical, general chemistry and microbiological parameters and metals analyzed, for which there are health-related ODWO*, none exceeded the objectives, in treated water.

The results of these analyses are consistent with those obtained in other areas of the Great Lakes.

The treated water from the supply did not exceed any known health-related guidelines for organic substances applicable to drinking water.

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* The Ontario Drinking Water Objectives, revised 1983.

WALPOLE ISLAND WATER TREATMENT PLANT

SUMMARY TABLE OF RESULTS
DRINKING WATER SURVEILLANCE PROGRAM, 1986

The Walpole Island Water Treatment Plant was sampled 4 times after April 30, 1986.

PARAMETER CATEGORY	TYPE OF SAMPLE RAW	TREATED*
1. GENERAL CHEMISTRY - includes anions such as sulphate, field analyses such as chlorine residual and physical parameters such as colour.		
Total number of parameters in category: 21		
- Total number of analyses completed	70	70
- Total number of positive results	65	51
- **Number of times guidelines exceeded**	**N/A**	**0**
2. METALS - includes metals such as copper and lead.		
Total number of parameters in category: 24		
- Total number of analyses completed	85	85
- Total number of positive results	34	36
- **Number of times guidelines exceeded**	**N/A**	**0**
3. BACTERIOLOGY - includes bacteria such as coliforms.		
Total number of parameters in category: 5		
- Total number of analyses completed	16	15
- Total number of positive results	16	2
- **Number of times guidelines exceeded**	**N/A**	**0**
4. VOLATILES - includes compounds such as benzene and toluene; also included in this category are trihalomethanes (5 parameters), acknowledged to be produced during water treatment.		
Total number of parameters in category: 29		
- Total number of analyses completed	112	112
- Total number of positive results	0	17
- **Number of times guidelines exceeded**	**N/A**	**0**
5. PESTICIDES -		
Total number of parameters possible in category: 65		
- Total number of analyses completed	110	123
- Total number of positive results	0	0
- **Number of times guidelines exceeded**	**N/A**	**0**
6. CHLOROAROMATICS AND CHLOROPHENOLS - includes a range of chlorinated organic compounds.		
Total number of parameters possible in category: 19		
- Total number of analyses completed	39	52
- Total number of positive results	0	0
- **Number of times guidelines exceeded**	**N/A**	**0**

* Total number of analyses completed will not always equal the number of parameters analyzed for multiplied by number of times the supply was sampled, because of accidents during shipping or analyses or analytical difficulties.

** Ontario Drinking Water Objective.